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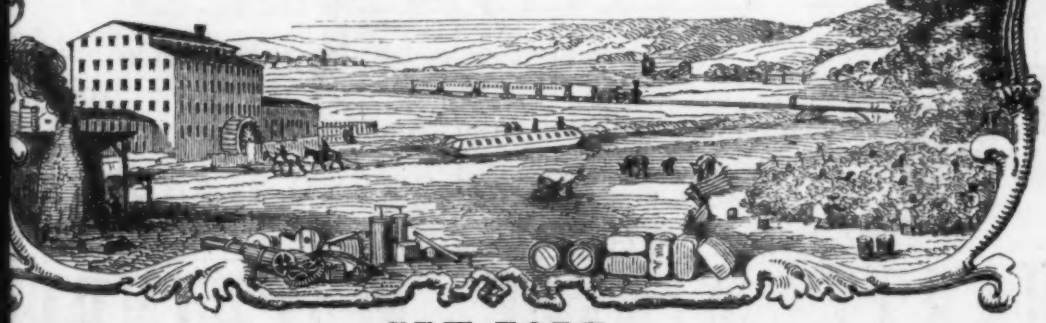
THE PLOUGH

THE LOOM AND THE ANVIL.

FARMER AND MECHANIC.

DEVOTED TO SCIENTIFIC AND PRACTICAL AGRICULTURE—MANUFACTURES—MECHANICS—NEW INVENTIONS—A SOUND PROTECTIVE POLICY—FARM BUILDINGS,—COTTAGE DESIGNS—FRUIT TREES—FLOWERS—GARDENING—BEES, CATTLE, HORSES, HOGS, SHEEP, POULTRY, &c.



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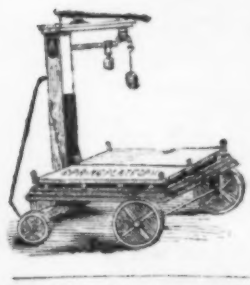

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The Plough, the Loom, and the Anvil.

PART I.—VOL. VI. JULY, 1853. No. 7.

THE GREAT EXHIBITION.

WE hope we shall be able to chronicle in the next number of our journal the opening of the Great Exhibition, which the public have so long been anticipating. The building is now drawing rapidly towards completion, and on the fifteenth of the present month it is expected the doors will be flung open for the admission of the public. It is a matter of regret that the work could not have been done earlier, so that all the advantage possible might be taken of the season. Yet we presume that little if any difference will be noticeable on account of numbers or of the contributions to the exhibition.

We hail these international Lyceums of Industrial Art and Science—the grand World-Jubilees of Labor and Invention—as the earnest of a better spirit than that which moved the ages of old. The race for artistic and mechanical superiority is one in which the world may safely engage. It will cost no nation its millions of gory and slaughtered victims; it will impose upon empires no tax on behalf of tens of thousands of pensioned wrecks of humanity, or of widows and orphans; it will create no national debt of thousands of millions of dollars. The dominion in the empire of the human mind is better and nobler than the rule over the bodies of men, estimated by devastated acres and impoverished millions. The subjugation of the wilderness and of savage hordes by the arts of peace and the discoveries of science, by the construction of mighty highways for commerce, and the international exchange of living, radiant Ideas, is a nobler conquest than the forcible and oppressive thraldom of the unsubdued although entrammelled races of the world.

We trust that this second World's Competition, now held on the shores of the New World, will be eminently successful in all its details. We regret the delay in the construction of the edifice and the opening of the exhibition, as it is not in harmony with the characteristics of the American mind—promptness and success in execution of plans and enterprises. Yet circumstances may be admitted in justification, and we hail the Art Festival as a significant and important event in the American chapter of the history of 1853.

From the published statement of the "Association for the Exhibition of the Industry of all Nations," we select the following facts, not merely for their own interest to mechanics and Americans generally, but as a fitting introduction to the records of the exhibition itself, a part of which we expect to furnish our readers hereafter.

"No edifice entirely of iron yet exists in the United States, and the want of experience on the part of both architects and engineers presented serious obstacles. Many ingenious plans were offered. Sir Joseph Paxton, with great

liberality, furnished one of singular beauty; but the peculiar shape of the ground to be occupied rendered it impossible to use it. The late lamented Mr. Downing—a name dear to this country—offered another of striking ingenuity, but this was also excluded by the terms of the grant from the city, which, as has been said, peremptorily required that the building should be exclusively of iron and glass. Mr. Leopold Eidlitz presented a plan with a suspension roof, intended to obviate the difficulty of spanning great widths by arches. Mr. James Bogardus submitted one of a circular building consisting of successive colonnades placed one over the other, somewhat resembling the Colosseum at Rome, and involving a new mode of joining for which he has obtained a patent. Mr. Julius W. Adams presented one of a great octagonal vault or dome, supported by ribs made of fasces or clusters of gas pipe. Several other plans were offered, of great beauty and originality. The task of selection was difficult and delicate; the Board, however, after much consultation, finally determined on one submitted by Messrs. Carstensen and Gildemeister. Mr. Gildemeister has been some time established among us, and is not only an architect, but an artist. Mr. Carstensen is the designer of the Tivoli and Casino of Copenhagen, the principal public grounds of that city, and had at this time recently arrived here.

"The plan was adopted on the 26th of August, and no time was lost in putting the work under way.

"The masonry contracts were signed with Messrs. Smith & Stewart and Mr. Lorenzo Moses, on the 4th of September, and on the 25th of the same month the principal part of the iron work was contracted for. By the masonry contracts, the foundation was to be delivered on the 21st of October, and by the iron agreements the delivery of castings was to commence at the same time. In order to secure uniformity, a pattern-shop was established in the city of New-York, under the charge of Messrs. Shepard & Purvis; and to insure dispatch, the first contracts for the delivery of the iron castings were divided among Messrs. Jackson, Stillman, Allen & Co., Hogg & Delamater, Buckup & Pugh, and F. S. Claxton, of New-York; Slater & Steel, of Jersey City; the Matteawan Company, of Fishkill; the Messrs. Templins, of Easton, Pennsylvania; Betts, Pusey, Jones & Seal, of Wilmington, Delaware; and Miller & Williamson, of Albany.

"We shall now go into the details of the site and size of the building. Reservoir Square, on which it is erected, lies at the northern extremity of the city of New-York, west of the Croton Distributing Reservoir, and between that mighty mass of stone and the Sixth Avenue. The precise distance from the Reservoir to the Sixth Avenue is 445 feet, and the width, north and south, from Fortieth to Forty-second street, is 455 feet.

"It will be observed that this piece of ground is nearly square. The shape is unfavorable for architectural purposes. In other respects no better spot for the purpose could be found in the city. The Sixth Avenue Railroad runs directly past it; the Fourth Avenue Railroad runs near it; and it lies immediately in the vicinity of the Fourth, Fifth and Sixth Avenues, the main thoroughfares of that part of the city.

"The main features of the building are as follows: It is, with the exception of the floor, entirely constructed of iron and glass. The general idea of the edifice is a Greek cross, surmounted by a dome at the intersection. Each diameter of the cross will be 365 feet 5 inches long. There will be three similar entrances; one on the Sixth Avenue, one on Fortieth, and one on Forty-second street. Each entrance will be 47 feet wide, and that on the Sixth Avenue will be approached by a flight of eight steps; over each front

is a large semicircular fan-light, 41 feet wide and 21 feet high, answering to the arch of the nave. Each arm of the cross is, on the ground plan, 149 feet broad. This is divided into a central nave and two aisles, one on each side; the nave 41 feet wide, each aisle 54 feet wide. The central portion or nave is carried up to the height of 67 feet, and the semicircular arch by which it is spanned is 41 feet broad. There are thus in effect two arched naves crossing each other at right angles, 41 feet broad, 67 feet high to the crown of the arch, and 365 feet long; and on each side of these naves is an aisle 54 feet broad, and 45 feet high. The exterior of the ridgeway of the nave is 71 feet. Each aisle is covered by a gallery of its own width, and 24 feet from the floor. The central dome is 100 feet in diameter, 68 feet inside from the floor to the spring of the arch, and 118 feet to the crown; and on the outside, with the lantern, 149 feet. The exterior angles of the building are ingeniously filled up with a triangular lean-to 24 feet high, which gives the ground plan an octagonal shape, each side or face being 149 feet wide. At each angle is an octagonal tower 8 feet in diameter and 75 feet high.

"Ten large and eight winding staircases connect the principal floor with the gallery, which opens on the three balconies that are situated over the entrance-halls, and afford ample space for flower decorations, statues, vases, &c. The ten principal staircases consist of two flights of steps with two landing-places to each; the eight winding staircases are placed in the octagonal towers, which lead also to small balconies on the tops of the towers and to the roof of the building.

"The building contains on the ground floor 111,000 square feet of space, and in its galleries, which are 54 feet wide, 62,000 square feet more, making a total area of 173,000 square feet for the purposes of exhibition. There are thus, on the ground floor, two acres and a half, or exactly $2\frac{52}{100}$; in the galleries, one acre and $\frac{44}{100}$; total, within an inconsiderable fraction, four acres.

"There are on the ground floor 190 octagonal cast iron columns, 21 feet above the floor, and 8 inches in diameter, cast hollow, of different thicknesses, from half an inch to one inch. These columns receive the cast iron girders. These are $26\frac{1}{3}$ feet long and 3 feet high, and serve to sustain the galleries and the wrought iron construction of the roof, as well as to brace the whole structure in every direction. The girders, as well as the second story columns, are fastened to the columns in the first story by connecting pieces of the same octagonal shape as the columns, 3 feet 4 inches high, having proper flanges and lugs to fasten all pieces together by bolts. The number of lower-floor girders is 252, besides 12 wrought iron girders of the same height, and 41 feet span over a part of the nave. The second story contains 148 columns of the same shape as those below, and 17 feet 7 inches high. These receive another tier of girders, numbering 160, for the support of the roof of the aisles, each nave being covered by 16 cast iron semicircular arches, each composed of 4 pieces.

"The dome is supported by 24 columns, which go up above the second story to a height of 62 feet above the floor, and support a combination of wrought iron arches and girders, on which rests a cast iron bed-plate, so constructed as to receive the 32 ribs of the dome. The light is communicated to the dome through the lantern, as well as from the sides, on which 32 escutcheons, in colored glass, representing the arms of the Union and its several States, or the emblems of the different nations, form a part of the decoration.

"The quantity of iron to be used for the building will amount to about

1,250 tons. The roof will cover an area of 144,000 square feet. The glass for the building will amount to 39,000 square feet, in 9,027 panes, 16 by 34 or 38 inches.

"On entering this building, the observer's eye will be greeted by the vista of an arched nave 41 feet wide, 67 feet high, and 365 feet long; while on approaching the centre he will find himself under a dome 100 feet across and 118 feet high.

"It is certain, therefore, that the edifice will be larger and more effective in its interior view than any thing in the country.

"The general mode of erection by base-pieces, columns, connecting-pieces and girders, is the same with that of the great Hyde Park building. But the construction of the arched nave and of the dome is of course entirely peculiar, and the general effect of the building is completely different. The London building was certainly deficient in architectural effect. The form of the New-York edifice affords the requisite scope for a pleasing variety of embellishment, by which all monotony can be avoided, and allows a very economical use of the ground. The dome, independent of its effect in the interior arrangement of the edifice, will give height and majesty to the exterior.

"The following are the objects which the architects appear to have striven to combine in their plan:

"1. The greatest possible area compatible with the ground employed.

"2. Perfect safety and elegance of construction.

"3. A well-calculated and pleasing admission of light.

"4. A variety of *coup d'œil* in the interior.

"This building will compare, in point of size, and it is thought of beauty, with some of the greatest edifices of the old world; and until the extension of the Capitol at Washington is completed, it will be altogether the largest in this country. It is hoped that it will be a great permanent architectural ornament to the city."

The sole charge of the interior of the building, its division, arrangements, classification and police, has been confided to two officers of the Navy of the United States, Captains S. F. Dupont and C. H. Davis.

These gentlemen have organized their departments as follows:

J. M. Batchelder, Secretary of the Superintendent.

Samuel Webber, Arrangement of Space and Classification.

Prof. B. Silliman, Jr., Mineralogy and Chemistry.

B. P. Johnson, Agricultural Implements.

Joseph E. Holmes, Machinery.

Edward Vincent, Textile Fabrics.

Felix Piatti, Sculpture.

The classification and arrangement of articles presented for exhibition is such that by the catalogue the visitor will be able to find any department he may wish to find, and also any article in it.

The machinery will be driven by two powerful and highly finished engines of 60 horse-power, built by manufacturers of note—the Lawrence Machine Works, and Nightingale, of Providence, R. I. The boilers are six in number, 40 feet long, 3 feet in diameter, and are in a building on the north side of Forty-second street, about 260 feet from the engines, to which the steam is conducted under the street through an 8-inch cast iron pipe.

We shall not occupy our pages with extended remarks upon this interesting event. The transactions will soon become matters of review, when we may speak of them as facts suggesting high and important considerations to all engaged in industrial pursuits.

RAILROADS IN THE UNITED STATES.

On the first of January, 1853, 13,227 miles of railroad were completed in the United States. About 13,000 were in progress, and about 7000 more were under survey. These items make an amount total in course of construction and actually built, of 33,000 miles. Supposing the average cost to be $30,000 a mile, this entire cost amounts to $990,000,000. The amount yet to be expended, and probably within the next five years, is, in round numbers, $600,000,000.

It is a question of some interest where this immense payment is to come from. It is nearly one fifth of the "cash value of all the farms" in the United States, as estimated in the last census. It exceeds in amount the "total value of live-stock," and is more than thirteen times the "total expenditures of the Government" of the United States for the year ending June, 1852.

Some portions of these roads consume a much greater amount of cost than we have here estimated; and very few fall below it. The expenses of some after the roads are constructed are almost incredible. The Erie Railroad, with its necessary furniture, has cost its stockholders, it is officially stated, over $30,000,000. The road extends 446 miles, and, including switches, side tracks and double tracks, has 701 miles of rails, and requires 140 locomotives, 131 passenger and baggage-cars, and 1885 freight and burden-cars, with the addition of a large sum expended for steamboats, car-houses, station-houses, freight-houses, telegraph line, &c.

But who receives the untold thousands, to earn which, requires the expenditure of these immense amounts? "Oh, the rich, of course." We beg pardon. The best roads seldom pay the "rich" stockholders—who, by the way, are often widows and orphans—so much as 8 or 10 per cent. on their investment. The chief part of these millions goes to the support of those who labor by the month and by the day. The engineers, firemen and switch-tenders, the shovel-and-spade-men, the wood-sawers and porters, and a host of others, all live on the vital heat imparted by the fiery iron horse. And how many of this class do you think there are, every one of whom, were railroads annihilated while you read this statement, would scarcely know where to earn the next dollar, but who are essentially dependent upon their daily labor for the daily support of themselves and their families?

There were employed on six of the principal roads in Massachusetts, as reported to the Legislature, 2,035 men, exclusive of those engaged in their construction. The length of these roads is 274 miles. Taking this as the basis of calculation for the roads above referred to, we shall find that when constructed they will furnish employment to more than 245,000 men; that is, to more than the entire white male population of either Alabama, Connecticut, Maryland, New-Jersey, or Michigan, and exceeds that of Arkansas, Delaware, Florida, Texas, and New-Mexico added together, by more than 40,000. They, with their wives and children, may be said to people the Railroad State.

But the *construction* of these roads gives employment to an immense multitude of men, each one of whom must otherwise be a public pauper, with his family, if he has one, or a rival in some other trade or calling.

But even this is only the fraction of this account. Who manufactured these rails? Some of our economists would send abroad for them. We are for doing this at home. But the rails alone for the roads now contemplated will cost over $100,000,000. And who gets this immense sum? The owners of stock in mines? They will do well to get from 6 to 10 per cent. on their

investments. See that crowd of miners, and those other hosts of shops' crews, symbolic, in their appearance, of the workshops of Vulcan, in the glare of the lurid light of the furnace and forge. Their life is also dependent upon the success of the Railroad enterprise.

Suppose that gigantic plan which many of us will live to see completed, the Pacific Railroad, were all in the hands of sub-contractors at once; would we have such an army of able-bodied beggars thronging our larger cities as we now witness? What an immense host in the various trades and callings this work would put into operation! how many would find in this project a permanent and thriving business.

The Railroad interest is not sectional. Like the air we breathe, the more it is wrought upon, the greater is its tendency to expansion. One city unites itself with the producer in the far interior, and, *presto*, its ambitious rival in the race for wealth adopts the same means "in self-defense," and both are benefited. And the third follows on, and so it goes from ocean to ocean. Thus these projects are found to-day, in every stage of progress, in the State of Maine and through New-England and New-York, on and still on, south and west and north, till the waters of the lakes in their tempestuous roar answer along these iron pathways to the noise of the waves that dash against the shores of the St. Lawrence, and the mouth of the Mississippi, as if with a tongue that can articulate, welcomes the traveller with his merchandise from the far East and North. We have thus found the promised land—not the land of rest and indolence, but of respectable and remunerating labor.

There is still another department in this immense interest which must not be overlooked. We refer to the labor expended in repairs. This, of itself, is of very great importance. We have before us a statement by the President of the Erie Railroad, which estimates "the annual self-destruction of motive-power" alone, referring only to their locomotives, at $311,311 16. He also says: "Were all the engines of the first-class dimensions and in *full use*, this amount would be increased far beyond your highest estimate of $426,000."

Having estimated the value of these incidental benefits resulting from the construction of railroads—benefits which were not even considered by those who were engaged in securing their construction—we are better prepared to appreciate their importance as the means of creating and improving the markets of the whole interior of the continent. This view we have partially presented in previous numbers of our journal, though the story is scarcely begun. We should be glad to give a condensed view of these effects, but must wait for more complete statistics.

MINNESOTA.

The following information is gathered from "The Minnesota Year-Book for 1851." If all our new States would present us their statistics, from time to time, in a similar form, a mass of information would be collected, in a course of years, of great value to the future historian:

It appears that general attention was first drawn to this Territory by accounts published by fur-traders in 1654, and by Jesuits who penetrated that wilderness "to convert the heathen to their faith." The first mission was in 1634, on Lake Huron. In 1796, the trading-posts on the Lakes were surrendered by Great Britain to the United States. In 1805, Fort Snelling was purchased by Lieutenant Pike, and since 1819 has been occupied by the United States troops. In 1848, Wisconsin was admitted into the Union

There were then some 3000 people in Minnesota, and they sent a delegate to Congress. In 1849, the Territory was organized, and an actual enumeration of all the inhabitants, except Indians, gave a total of 4,680. Of the twenty-seven counsellors and representatives, nine are from New-England. By provision of law, every township, if not less than five families, is considered a school district, and a majority may vote a tax for school purposes, to be levied upon the property of the district, said tax not to exceed $600 in any one year.

St. Paul is the capital of the Territory. Its population is 1,294. Number of families, 257. It is about nine miles from St. Anthony. Among the industrial occupations enumerated, are five blacksmiths, four bar-keepers, five cooks, two cigar-makers, two editors, seventy-seven farmers, ten grocers, *six gamblers*, four hotel-keepers, seventeen lawyers, three livery stable-keepers, twenty-one mechanics, three ministers, six physicians, one sailor, three school-teachers, &c., &c.

Twenty other settlements are described, all of them on the upper Mississippi. "The cash value of farms," by the census, is $193,003. The number of cows, 534; working oxen, 667.

The northern part of Minnesota is covered with forests of heavy pine. The lumber-trade is very lucrative. During the winter of 1849–50 one team made $2,000 in the pinery. The average of green lumber at the mill is $12 per thousand. Dry lumber at St. Paul's in 1850 was $30 per thousand feet. 160 acres of land cost from $120 to $160. In St. Paul's, flour is $7 per barrel; potatoes, 50 and 75 cents; beef, 8 cents; pork, 10; lard, 14; eggs, 25; oats, 50 to 75; butter, 25.

STENOGRAPHY AND PHONOGRAPHY.

The meaning of these two terms is substantially the same. The former is compounded of two Greek words, signifying, the one "close," the other, "to write." The latter is taken from the same language, the first half of which signifies "sound," with the same word for a termination, "to write." The literal translation of the two may be, of the first, *to write concisely*, and of the second, *to write as sounded*. Both systems would use characters corresponding to the following example:

"The condishun of sum peple is reched enuf,"—meaning, obviously, "The condition of some people is wretched enough." The mode of spelling, therefore, is essentially the same in both.

The two systems, however, differ very substantially in the form of the characters used, and, of course, in the facility with which they are made; and in this respect the system of Phonography has, in our opinion, a decided advantage over all other kinds of short-hand. Many years ago we devoted considerable time to Byrom's system—we think that was the name, though even the name is almost passed out of our recollection—and we found it quite practicable to learn to write it, though it was far more difficult to read what we had written. But to do either required a long time. We afterwards met with another system which we attempted to acquire, and in which we made some progress, but we soon abandoned the idea of making it practically useful. In 1846 or 1847 we were brought into contact with a "professor" or teacher of Phonography, and obtained the necessary books and began the study and practice of the art. In a week or so, spending an hour or two each day, we could read with tolerable ease the *first* form of the language, and write it, slowly, with tolerable accuracy. We continued to give

the subject such attention as other avocations would permit, until we had secured quite a command over the characters, and we had advanced into the mysteries of the third or reporting style; and though there have been several months together in which we have not given the subject the least attention, we have never lost our interest in it, but have rather made progress in the art. But to acquire a facility in writing requires time and thought. As in every other good thing, patience must be exercised. A boy of twelve years old will write easily any word he may wish to use after as many *hours'* study, and can read, slowly, his own writing or printed books with little trouble. But to be able to command his pen or pencil so as to follow a speaker, is a work of months of constant and laborious effort. The ability to write as rapidly as we can with the common English alphabet will ordinarily require only the practice of some thirty or forty hours; often much less than this will suffice. A good memory is of advantage in this art, though not essential. We have known persons begin this study and abandon it in despair.

Phonography is written in three forms: the long hand, the corresponding style, and the reporting style. In the first, every consonant which is sounded is written, and the vowels are inserted. But every consonant is made by a single mark. In the second form, part of the vowels are omitted, and about a hundred words of frequent occurrence are represented by the characters representing single letters. Other characters also represent the more common prefixes and suffixes; as de, in, com, inter, &c., and ly, tion, &c. In the third form the vowels are chiefly omitted, the number of characters representing words are increased two or three-fold, and various other contractions are used.

To gratify not only the curiosity but the rational desire of some whose eye may fall on these pages, we will point out, by a few examples, the manner in which the wonderful conciseness of this mode of writing is secured, and the chief sources of difficulty which the pupil must encounter.

1. Every consonant sound, whether single or double, is made by a single character. Thus , , , , stand for the *consonant sounds* of d, b, m, and n.

The characters and stand for p and n, and when united form the words pan, pen, pin or pun, without the addition of a vowel, or any vowel may be inserted at the option of the writer.

Again, stands for t; but with a hook on one side ( ) it stands for tl, and on the other ( ) tr; if a circle on the right side is substituted, we get an s instead of l, for is st; but if the circle were on the left side, we should get str. united, pt, may express pat, pet, &c., as the sense may require, or any vowel may be written before, between, or after them, making apt, pat, pit, put, pot, pate, peat, or pout, or, by using two vowel dots, patty, petty, pity or putty. The connection would readily show which word was intended. But the vowels, if inserted, would show the word at a glance.

The vowels are mere dots or some other simple form that can be written at a dash of the pen, and their sound is determined by their position. In some few of the following examples they are written. Thus a small dot before the top of the t makes the word *it;* before the middle of the t, *et* or *ate;* and before the bottom of it, *at.* The *vowel sounds* wa, we, wi, &c., and ya, ye, &c., are expressed by a very small curve. Thus is *wit*, and if at the middle of the *t*, it would become *wait* or *wet.*

These vowels are often omitted without any inconvenience. Thus, *ths pn s bnt* may readily be recognized as *this pin is bent.* So, *a gd mnr s imprtnt,*

with very little practice would instantly be rendered, *a good memory is important.*

3. No silent letters are ever written. Instead of *the troubled stream of time*, we should write, *the trubld strēm of tīm.*

4. Words of very frequent occurrence are expressed by the simplest characters.

Terminating syllables and prefixes are represented by a single movement of the pen: thus, ⌞ stands for f. But with a curve turned from the bottom, which curve means tion or sion, thus ⌞◡, we have *fashion;* again, if made heavy it becomes v, and this, with the turn ◡, becomes v-sion, or *vision;* or an s may be added at the end, as ⌞◡; and again, con, com, &c., as prefixes, are written by a dot above the next syllable of the word. Hence, while the last character stands for passions, a small dot before or above it renders it *com*-passions.

Writing a letter only half length adds t or d to it. Thus, if *p* is written but half its proper length, it expresses *pt*, and *f* standing alone expresses the word *if*, but when of half-length only, it expresses *ft* or *if it.* The *d* stands for the verb *do*, but when of half-length, it is *did.* The *n* is the word-sign for *no* or *know*, but if of half-length, it expresses *not.*

Lastly, these simple marks stand for entire words. Thus ` ´ ‿ , stand for of, on, but, who. The letter (g) ¯ above the line stands for *give* and *given;* on the line, for *together;* made half the ordinary length, the former becomes *God*, and the latter *good.* These *word-signs* amount to three or four hundred in number. These characters may also be grouped, and by a little experience the eye recognizes them at once, and you read a whole phrase at a single glance of the eye. Each movement represents an entire word. Thus the following are examples.

⌞ which it-would-not; ⌞ with-which it-is-not; ⌞ it-is-not; ⌞¬ I-have-not-had.

We give these examples only as *samples* of the modes adopted by this system. Other forms of contraction are used, quite as important as either of these, while all combined form an admirable system of short-hand which, as the result of careful study, is scarcely equalled by the original invention of any one mind. This was no accident, but the result of a careful and critical analysis of the sounds of the language, and is applicable alike to all languages.

Phonography has been introduced into many of the common-schools, and has been found a very profitable exercise. We understand that Mr. Webster purposes to commence instruction in this city the coming autumn. He is abundantly competent, and we wish him success.

AFRICA—LEVEL OF THE RED SEA.

We find by a series of levellings recently carried across the Isthmus of Suez, that instead of there being a difference of thirty feet between the level of the Red Sea and that of the Mediterranean, as has so long been believed, there is in reality little or none: an interesting fact, which will be still further verified during the progress of the railway works to be set on foot in that locality under the superintendence of Mr. R. Stephenson. How the past and present will be brought together by having light thrown on ancient geography by modern enterprise! Besides this, an attempt is being made to solve another important problem in the Valley of the Nile. Lepsius has stated in his great

work on Egypt, that this river formerly flowed at a much higher level than now, having in the course of ages worn away its bed to a depth of twenty-seven feet; and this statement being disputed, a deep pit or well is to be sunk at Heliopolis, with a view to examine the strata and deposits through which it flows, and thereby determine if any and what change has taken place. The work for this purpose is under the direction of Mr. Leonard Horner, who defrays the cost with a portion of the annual grant placed by Government at the disposal of the Royal Society, which has lately received a consignment of cases filled with specimens of the earth taken from the excavation. Meanwhile it appears that, like Sweden, the Arabian Gulf region and Abyssinia are undergoing slow and gradual upheaval. In addition to these researches, active explorations are going on in the north, east, west, and south of Africa, and more than one treaty of commerce has been signed between England and the petty monarchs of the interior. The Rev. Mr. Livingston announces the existence of another large lake, 200 miles north-west of that now known as Lake Ngami; the great Lake Tchad is being navigated by European boats; and efforts are being made to reach those mysterious mountains in which the Nile is supposed to rise, for, as Captain Smyth observes, "no European traveller, from Bruce downwards, has yet seen its true source."—*Chambers' Journal.*

THE WANTS OF THE SOIL—AND OF FARMERS.

THE *Genessee Farmer* publishes a short article with the first part of the title above given, which contains some very curious statements. It cites a memorial to Congress on the subject of a National Normal School of Agriculture, written by the editor referred to, which he seems to regard as of immense importance. If true, these statements certainly are important, and demand immediate attention.

We first give the article, and then our own comments.

"At present, not far from three fourths of the entire labor and capital of the United States are employed, either directly or indirectly, in the great work of robbing the soil of the few things that God hath placed in it for the support of vegetable and animal life, without making or pretending to make any adequate restitution. All tillage is a most unnatural operation, and the matter removed in crops by no means indicates the whole of the loss of the elements of fertility that arated fields sustain. An intelligent wheat-grower in Wisconsin writes to the agricultural department of the Patent Office, that lands which have been cultivated twelve years in that new State, now yield but half the annual harvests that they did when first tilled and seeded. An extensive corn-grower in Indiana informs your memorialist, that the rich river bottoms of that State now yield seventy bushels per acre. Maize being by far the most important crop grown in this country, much pains have been taken to learn the commercial value of the raw material necessarily consumed to form a bushel of grain; of which over six hundred million bushels are annually extracted from American soil.

"A gentleman in Connecticut writes, that his farm, of some two hundred and fifty acres, has been cultivated two centuries, and consequently has reached what may be regarded as the normal condition of long-tilled earth He finds it necessary to apply ten cords of compost manure to an acre, to raise forty bushels. The manure costs him a dollar a cord, and twenty-five cents per bushel of his crop. A corn-grower in Virginia has tried many experiments with guano, and finds that one hundred pounds, which cost two dollars and fifty cents, will generally add ten bushels to his harvest. The

manure, like that used in Connecticut, costs a quarter of a dollar for enough to produce a bushel of corn. Many letters from practical men of close observation and large experience have been received at the agricultural department of the Patent Office, going to show that if one draws not upon the natural fertility of land to form his corn plants, the raw material to make a bushel of corn can rarely be obtained for a less sum than twenty-five cents. There is collateral evidence worth naming, that corroborates this estimate. Long experience in France and Belgium establishes the fact that the *excreta* from an adult person are worth five dollars a year for agricultural purposes. The night-soil obtained from the human species is equal to the production of twenty bushels of corn to each inhabitant; and for the obvious reason, that no animal has the power to annihilate a single atom consumed in its daily food, nor to create one, if needed to prevent starvation. Field laborers at the South consume about thirteen bushels of corn meal, and as much bacon as from ten to thirteen bushels of corn will make, as the yearly allowance to each. Children consume less, but often waste more than adults. Taking our entire population of 25,000,000 at this time into account, and each consumes, in one form and another, fertilizing atoms drawn from the bosom of the earth, equal to those contained in twenty bushels of maize; showing an aggregate annual consumption of 500,000,000 bushels, which the soil loses as effectually as it would if that amount of grain were cast into the sea every year."

The subject is two-fold. The first relates to the "unnatural operation" of "tillage." When the word *unnatural* is used as in this connection, we suppose it must be defined as something essentially opposed to nature. But we have supposed that crops were natural productions; not something contrary to nature. Again, we have supposed that the original object of the physical creation was to afford a residence for its future inhabitants, and to furnish them with food and other products, calculated to promote the comfort of the living beings which should dwell upon it. Was Adam placed in the garden for an unnatural purpose? To us the idea is only ludicrous.

But is tillage in any sense "unnatural?" We can attach no possible meaning to the phrase which would make it the expression of truth. The whole science of farming is professedly in accordance with the laws of nature. In no other way can crops be raised. If there is any sense in which the phrase we criticise is admissible, it can only be when applied to the *forcing* system resorted to, not by farmers, but by a few horticulturists; who, by a concentration of nature's energies, light, heat, and gaseous elements, secure a more rapid growth than, when left to herself, dame Nature is accustomed to exhibit. But our brother editor is speaking of tillage in general; and to prove it, apparently, he cites numerous instances in which the amount of crops has essentially diminished. Now we should say that this was for the *want* of tillage. It is because nature is left to her own resources in producing our crops. The *harvesting* of crops may be called unnatural in some sense; for nature, if left to herself, would work up her previous products into new growths. But we abstract them from her for our own benefit, and fail essentially to replace them; that is, if we *neglect* "*tillage*," we rob her of the means of continuing her own accustomed processes; processes without which her nature—that is, herself—must change from being fertile to a barren waste. Tillage alone enables nature to remain herself, while we appropriate her annual growths to our own use. But we take the opportunity offered by this short extract, to say that we have no confidence whatever in the Doctor's prescription as a remedy for the evil, by whatever name it is

called. Want of cultivation, neglect of tillage, an attempt to obtain from nature what she cannot give, good crops without suitable cultivation—this is the great, the almost universal mistake of our farmers. They must cultivate the soil, or nature itself will become as inefficient as they are.

But why do they not cultivate? We answer, that, as a general thing, it is not because they are not satisfied that cultivation would secure better crops. There is not a farmer living in civilized communities that does not believe that increasing the supply of suitable manure would increase his crops. But where is he to obtain his supply? He keeps all the cattle he thinks he can afford to keep; he uses all the manure he can collect; and still he earnestly desires more, *much more.* But he "can't afford" to buy. He "can't afford" to buy and compound artificial ingredients that furnish a very good substitute for barn-yard (vegetable) manure. So he thinks; and though he is probably mistaken, he is nevertheless obliged to act according to his own convictions. The first thing to be done, in our view, is to correct this opinion, and satisfy him that "tillage" is not only not "unnatural," but absolutely indispensable; that without it, no man eventually can afford to plant his seed. The crops will not pay the cost of obtaining them. Now, how will the Doctor's prescription, "a National Normal School" of agriculture, correct his opinions on this subject? He can't attend that school; nor can he send his son there. Those only who till and cultivate in a high degree can afford to send to such an institution. "But they will publish their very successful experiments, and thus produce conviction." And will they publish "gratis?" Oh no. He must take "the national agricultural organ of the National Normal School;" and pay for it, too; and pay in advance. But will that paper be any better than some that are now published? We have them now regularly issued by the *would-be editors* of that *National Farmer.* We doubt very much whether we should get any better.

Besides, this idea of "all the wisdom" in any one journal, in any one department of science, is suited only for a one-man government, and the said editor would be very apt to transform himself into a one-idea man. Some of us are quite assuming enough now.

Disseminate—*disseminate*—this is *our idea.* Let every State paper, every country paper, every village sheet which is published, every school, every academy and every college teach the reverse of the doctrine we have been criticising, and proclaim that the command of nature is, Cultivate—*cultivate*—CULTIVATE—and we shall by and by discover that reform is already secured, and that we are following the law that God established in every department of the natural world, namely, that to furnish the best possible materials in the best possible condition is the only way in which we may confidently anticipate the best possible results.

OCEAN STEAMERS BELONGING TO THE PORT OF NEW-YORK.

A LATE number of the *Journal of Commerce* contains an article from which we gather the following facts. The several lines of Ocean Steamers consist of the number of ships and of the tonnage given below:

	SHIPS.	AGGREGATE TONNAGE.
Cunard Line, - - - - - - -	9 -	10,000
New York and Liverpool and United States Mail Steamers, (Collins's,) - - -	6 -	13,000
Ocean Steam Navigation Company, - - -	2 -	3,300

New-York & Havre Steam Navigation Company,	3	4,400
Glasgow and New-York Steamship Company,	1	1,962
New-York and Southern Cities,	17	21,912
Pacific Mail Steamship Company,	13	13,000
United States Mail Steamship Company, (Atlantic side,)	10	19,600
Vanderbilt's Line, *via* Nicaragua,	10	18,000
New-York and San Francisco Steamship Company,	4	7,400
Empire City Line,	3	6,800
Total number of ships,	69	119,374

Where there is surplus production, there will be commerce. Commerce follows industry, and never leads it. Profitable industry, actually in operation, or the confident belief in it, alone can open the channels of the seas.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

AN AMERICAN SCHOOL OF MINES.

MESSRS. EDITORS:—The mining interests of this country are worthy of the special attention of all who are attracted towards the consideration of our productive industry. A vast territory, so rich in its mineral treasures as is ours, cannot safely neglect so important a branch of its internal resources as that offered by its stores of metals, and it is a promising sign that so much attention is of late given to these great interests. Among these, we are reminded of the vast repositories of valuable ores in Sussex county, New-Jersey, where the celebrated red oxide of zinc and Franklinite occur in mountainous profusion. Until a few years ago, these ores were thought to be almost too impracticable to be reduced, and for a long time they were entirely neglected. But a new spirit was infused into the mining affairs of the country, and it reached the Sussex hills, and the zinc paint, beautiful and economical, is now abundantly produced. The Franklinite is undergoing careful and extensive examination and experiment, and we have little doubt it will be found to furnish a strong and valuable iron for the market. It is pronounced superior for axles and similar purposes, and we believe that this long-neglected ore will soon become an article of general demand in the manufacture of choice machinery. But it requires, beyond doubt, all that scientific and practical knowledge can do, to give it its true value. This is only one of the numerous indications of the growing interest in mining enterprises.

The constant development of the vast mineral resources of this country is one of the most prominent results of the progress of population westward and northward, and points in the future to sources of national wealth and independence of which we can now form but a moderate estimate. A few years since, when the tradition of the Copper Rock of Lake Superior was almost all that was actually known of the immense quantity of that metal in a pure state which was treasured up with the various ores and oxides on the Ontonagon and the lake shores, no one could have dreamed of the vast masses which a short time was to expose to view, or of the future yield of ordinary, not to say of scientific mining.

A few leagues distant to the south and west of the copper region, the great depositories of lead in Illinois, Iowa, and the region of the Mississippi,

have for many years measurably rewarded the labors of capitalists and miners who have chosen to make their investments in that field. Unquestionably but a portion of these treasures has been discovered, as the recent penetration of several extensive caves, said to contain immense quantities of lead, and much of it highly argentiferous, seems to prove.

The gold mines of the Southern States, more particularly the placers of California, are a clear evidence that a more economical and scientific system of mining is indispensable to the full development of the auriferous wealth of our country. As soon as the placers and stream-beds of California shall have been overrun, wastefully as they have been and will be, until exhausted, the gold of that rich region will be sought, as it is now beginning to be, *in situ*, in the veins of the mountains, and in the massive rock, whence the golden sediment has been washed by the storms and floods and erosions of thousands of years. Scientific mining in California would have added probably thirty per cent., if not more, to the yield which has been hastily snatched from its various localities.

But in addition to these, the extended area of the interior continent, from a short distance west of the Mississippi to the borders of the Pacific, is yet to be explored. In this portion of the country explorers are no doubt destined to uncover silver, lead, copper, iron, and gold, while tin, quicksilver, and blende may yet be found in quantities which shall afford the richest remuneration. The Great Basin, Utah, New-Mexico, Oregon, California, Missouri Territory, and the western parts of Missouri, are fields in which coal, not less than the metals, may be found in almost exhaustless quantities.

Yet it is not to the precarious and adventitious products of the gold and silver mines that we look for the true mineral wealth of the country. An accessible deposit of iron ore, of the right per centage to make it yield an iron of good quality, with the natural facilities of fuel, water-power, &c., &c.. would be a greater treasure to each State than a gold mine.

But the metals are not alone the field for the scientific and practical man. The unlimited coal regions of our country, extending from the heart of Pennsylvania southward and westward, and covering so much of the Valley of the Mississippi, with the wide fields beyond, open a domain in which enterprise and capital are yet to find a rich reward.

Many and disastrous have been the undertakings in which a want of scientific and practical knowledge has brought only disappointment and ruin to the adventurers. Professor (now Sir Charles) Lyell, in his lectures at the Broadway Tabernacle, when in New-York, during his first visit, in speaking of the benefit resulting from our State geological surveys, made the following remarks, which cover our whole ground:

"I have been favored with a map, illustrating these points, by Prof. Hall, one of the State geologists engaged in surveying this State, whose labors will soon be made public. And here I cannot avoid saying, that I have been over much of the ground which they have surveyed, and it gives me great pleasure to bear testimony to the accuracy of their labors, to the great pains they have taken, and the science with which they have conducted the survey. I look forward to the appearance of their work, embracing the results of their labors, as *an era in the advancement of science;* and the patronage which has been afforded by the different States of the Union to these surveys is much greater, in proportion to the population, than any European power has ever extended to the advancement of geological science. When we remember, too, the complaints that may be heard in different parts of the State, that the geologists have failed to discover any mineral wealth, even in

an economical point of view, these scientific researches are of high value, though their greatest interest arises from the promotion of the knowledge of the structure of the globe.

"But merely in estimating the mischief they have prevented, we shall see an ample remuneration for all the expense attending the survey. I have been told that in this State alone more than a million of dollars have been expended since the Revolutionary War in boring for coal in formations where *it is impossible to find any*—below the carboniferous strata. I should not, to be sure, have ventured to generalize from Europe as a type, and say that the rocks in the crust of the earth occupy the same relative position here, and that coal would be found always in this country under the same conditions as in Europe. But when for twenty years or more we find coal accompanied by the same plants, and that no valuable fuel has ever been found under any other circumstances, we should be safe in saying that none could be found in the older strata. If we begin in the newer beds, we may come down to the coal, and find enough coal to pay the expense of boring for it. But if we begin in the strata beneath the carboniferous, we should never reach the coal until we had bored through the whole earth: we might find it at the antipodes, but not before.

"Thus complaints are made against these geologists, not only that they have found no coal, but that they have passed sentence of sterility upon the State, for they say that through all time no coal shall be found within its borders. And when we reflect on the enormous sums that have been wasted upon strata more ancient than the coal, in searching for coal, we shall see the great saving made in consequence of this survey; for when all its maps and sections are published, it will be seen how impossible it is to find coal in those more ancient beds. This is a kind of advantage which is never easily appreciated; because, to prevent mischief is never so clear and palpable a benefit to the multitude as to find mineral wealth. But one of the greatest advantages which have resulted from these surveys in England—and it will be among the greatest here—is the prevention of this rash and absurd speculation to find coal in strata below that in which those plants known to be essential to the formation of coal are found to exist: and after examining the whole ancient strata, both in the United States and in Europe, there has never been found a single bed of coal where these plants do not exist."

Such being the results of scientific discovery and long experience, it is obvious that the services of men who have given the subject their careful attention and laborious study must be of prime importance. The best miners may sometimes be mistaken, and the results far other than flattering, yet the general rule of economy and policy would be to employ competent men as engineers in mines.

The mineral wealth of the country being of so much importance, and the wants of the rapidly increasing population becoming so much greater every year, the value of a large body of scientific and thorough miners becomes more and more apparent. Yet we believe there is no institution in this country which pays any thing more than an incidental attention to this department of practical science and engineering. We think the time has come when a school for the formation of scientific miners, embracing in its instructions the whole field of Mathematics, Engineering, Geology, Chemistry, Mineralogy, and Natural Philosophy, could be abundantly sustained. The whole course of teaching should be adapted to the education of young men to act as miners, with scientific and practical knowledge sufficient to antici-

pate and prevent those frequent Utopian enterprises that often absorb splendid fortunes, as well as ruin men of only moderate means.

We invite the attention of the public to this suggestion. Whether the remodelling of some institution already established, or the founding of a new school, be resolved upon, we are convinced that an American School of Mining is needed, and will yet render signal service to the great industrial interests of the republic.

GOOD COUNSEL BY FANNY FERN.

We have not a very great regard for much of the productions of the Triphenas and Sophronias and Jerushas who adorn the pages of so many *weekly* sheets, but the following "Chapter for Nice Old Farmers," by *Fanny Fern*, in the *Olive Branch*, is too good to be unnoticed, and we give it a place in our pages:

Can any body tell why country people so universally and pertinaciously persist in living in the *rear of the house?* Can any body tell why the front door and windows are never opened, save on the Fourth of July and at Thanksgiving time? Why Zedekiah, and Timothy, and Jonathan, and the old farmer himself, must go *round* the house in order to get *into* it? Why the whole family (oblivious of six empty rooms) take their "vapor bath" and their meals, simultaneously, in the vicinity of a red-hot cooking-range in the dog-days? Why the village artist need paint the roof, and spout, and window-frames bright crimson, and the doors the color of a mermaid's tresses? Why the detestable sunflower (which I can never forgive "Tom Moore" for noticing) must always flaunt in the garden? Why the ungraceful, prim poplar, fit emblem of a stiff old bachelor, is preferred to the swaying elm, or drooping willow, or majestic horse-chestnut?

I should like to pull down the green paper window-curtains and hang up some of snowy muslin. I should like to throw wide open the hall door, and let the south wind play through. I should like to go out in the woods, and collect fresh, sweet wild-flowers to arrange in a vase, in place of those defunct dried grasses, and old maid "everlastings." I should like to show Zedekiah how to nail together some bits of board for an embryo lounge; I should like to stuff it with cotton and cover it with a neat "patch." I should like to cushion the chairs after the same fashion. Then I should like, when the white haired old farmer came panting up the road at twelve o'clock, with his scythe hanging over his arm, to usher him into that cool, comfortable room, set his bowl of bread and milk before him, and after he had discussed it, coax him (instead of tilting back on the hind-legs of a hard chair) to take a ten-minutes' nap on my "model" sofa, while I kept my eye on the clouds to see that no thunder shower played the mischief with his hay.

I should like to place a few common-sense, practical books on the table, with some of our fine daily and weekly papers. You may smile; but these inducements, and the comfortable and pleasant air of the apartment, would bring the family oftener together after the day's toil; by degrees they would lift the covers of the books, and turn over the newspapers. Constant interchange of thought, feeling and opinion, with discussions of the important and engrossing questions of the day, would of course necessarily follow.

The village tavern-keeper would probably frown upon it; but I will venture to predict for the inmates of the farm-house a growing love for home, and an added air of intelligence and refinement, of which they themselves might possibly be unconscious.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

WASHING SHEEP—MANAGEMENT OF SHEEP AT SHEARING.

MESSRS. EDITORS:—The old practice of washing sheep, or, as may be properly said, besmearing them with a decoction of tobacco, should be abandoned, although it may be a sure exterminator of the vermin. I have known the poor animal entirely prostrated by the intoxicating effects of the tobacco wash, and have heard of its causing instant death: at any rate, it cannot be agreeable to the animal, and can produce no good effect but to destroy the vermin, while a wash of strong salt brine is quite as efficient in doing this as the above-named decoction, and is productive of many good results besides. When the sheep are sheared, take a stiff brush dipped in the solution, and rub them all over with the saturated brush, which will produce a white lather or foam. This stimulates the skin to redness, and prevents the animal from taking cold; it loosens the scurf, and promotes the future growth of the wool, and also improves its quality. I have known this recipe to be used for several years with excellent effect. Yours,

ARIEL HUNTON.

POINTS OF CATTLE.

THE New-York State Agricultural Society has taken the matter of uniformity of points in cattle in hand. A scale for four breeds—Short Horns, Devons, Herefords and Ayrshires, by Francis Rotch, Esq., a gentleman adequate to the task, is already published. We give below from the Boston *Cultivator* the points of the Short Horn.

SHORT-HORNS—THE COW.

Pedigree. Showing unbroken descent, on both sides, from known animals, as found in the English Herd-Book; 40.

The Head. Small, lean and bony, tapering to the muzzle; the face somewhat long; 2.

The Nose. Of a light delicate color; 1.

The Eye is of great significance, and should be prominent, bright, and clear; "prominent" from an accumulation of "adeps" in the back part of its socket, which indicates a tendency to lay on fat; "bright," as an evidence of a good disposition; "clear," as a guaranty of the animal's health; whereas a dull, sluggish eye belongs to a slow feeder, and a wild, restless eye betrays an unquiet, fitful temper; 2.

The Horns. Light in substance and in color, and symmetrically set on the head; the ear somewhat large, thin, and with considerable action; 1.

The Neck. Rather short than long, tapering to the head; clean in the throat and full at its base, thus covering and filling out the points of the shoulders; 2.

The Chest. Broad from point to point of the shoulders; deep from the anterior dorsal vertebræ to the floor of the sternum, and both round and full just back of the elbows; sometimes designated by the phrase, "thick through the heart." These are unquestionably the most important points in every animal, as constitution must depend on their perfect development, and the ample room thus afforded for the free action of the heart and lungs; 8.

The Brisket, however deep and projecting, must not be confounded with *capacity* of chest; for though a very attractive and selling point, it in reality adds nothing to the space within, however it may increase the girth without.

It is, in fact, nothing more nor less than a muscular adipose substance, attached to the anterior portion of the sternum, or breast-bone, and thence extending itself back. This form, however, of the brisket, indicates a disposition to lay on fat generally throughout the frame, and in this point of view is valuable; 4.

The Shoulder, where weight, as in the short horn, is the object, should be somewhat upright and of good width at the points, with the blade-bone just sufficiently curved to blend its upper portion smoothly with the crops; 3.

The Crops must be full and level with the shoulder and back; and is perhaps, one of the most difficult points to breed right in the short-horn; 4.

The Back, Legs, and Hips should be broad and wide, forming a straight and even line from the neck to the setting on of the tail; the hips or hucks round and well covered; 6.

The Rumps laid up high, with plenty of flesh on their extremities; 3.

The Pelvis should be large, indicated by the width of the lips and the breadth of the twist; 2.

The Twist should be so well filled out in its "stem" as to form nearly an even and wide plane between the thighs; 1.

The Quarters, long, straight, and well developed downwards; 3.

The Carcass, round; the ribs nearly circular, and extending well back; 4.

The Flanks, deep, wide, and full in proportion to condition; 1.

The Leg, short, straight, and standing square with the body; 2.

The Plates of the belly strong, and thus preserving nearly a straight line; 1.

The Tail, flat and broad in its root, but fine in its cord, and placed *high* up and on a level with the rump; 2.

The Carriage of an animal gives style and beauty; the walk should be square and the step quick; the head up; 1.

Quality. On this the thriftiness, the feeding properties, and the value of the animal depends, and upon the touch of this quality rests, in a good measure, the grazier's and butcher's judgment. If the "touch" be good, some deficiency in the form may be excused; but if it be hard and stiff, nothing can compensate for so unpromising a feature. In raising the skin from the body between the thumb and finger, it should have a soft, flexible and substantial feel, and when beneath the outstretched hand, it should move easily with it, and under it, as though resting on a soft, elastic, cellular substance; which, however, becomes firmer as the animal "ripens." A thin, papery skin is objectionable, especially in a cold climate; 8.

The Hair should be thick, short and mossy in water; fine, soft and glossy in summer; 1.

The Udder, pliable and thin in its texture, reaching well forward, roomy behind, and the teats standing wide apart, and of convenient size; 1.

POINTS OF THE SHORT-HORN BULL.

As regards the male animal, I have only to remark, that the points desirable in the female are generally so in the male, but must, of course, be attended by that masculine character which is inseparable from a strong, vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get.

In contradistinction to the cows, the head of the bull may be shorter, the frontal bone broader, and the occipital flat and stronger, that it may receive and sustain the horn; and this latter may be excused if a little heavy at the base, if its upward form, its quality and color be right. Neither is the looseness of the skin, attached to and depending from the under jaw, to be

deemed other than a feature of the sex, *provided* it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap.

The upper portion of the neck should be full and *muscular*, for it is an indication of strength, power, and constitution. The spine should be strong, the bones of the loin long and broad, and the whole muscular system wide, and thoroughly developed over the entire frame.

EXPERIMENTS WITH GUANO.

As many of our planters are now about trying guano on their crops, we publish for their benefit the following experiments made by Col. T. E. Law, of Darlington District, which were published in the *Darlingtrn Flag* of the 17th:

Experiment 1st, made on land in a high state of improvement from former manurings.—100 lbs. guano per acre produced 1872 lbs. of seed cotton.

Hog-pen manure produced 1768 lbs. seed cotton.

Difference in favor of guano, 104 lbs.

Cost of 100 lbs. guano, $2.50. Worth of 104 lbs. seed cotton, $2.60, or equal to 104 per cent. on cost of guano, over hog-pen manure heavily put on.

Experiment 2d.—On poorer land, 100 lbs. guano per acre produced 988 lbs. seed cotton; without manure of any kind, 676 lbs. seed cotton.

Difference in favor of guano, 312 lbs. seed cotton, equal to 312 per cent. on cost of guano applied.

Experiment 3d.—150 lbs. guano per acre made 1508 lbs. seed cotton; hog-pen manure, 1352 lbs.

Difference in favor of guano, 156 lbs., equal to 104 per cent. on cost of guano.

Experiment 4th.—150 lbs. of guano per acre made 978 lbs.; 200 lbs. guano per acre made 962 lbs.

Difference in favor of 150 lbs. guano, 26 lbs.

This experiment was made on two rows of each, instead of one, as in the other cases; and it so happened that it was where a fence had stood several years, and had been moved, which I think is the cause of giving advantage to the smaller quantity of guano applied.

Experiment 5th.—50 lbs. guano per acre made 676 lbs.; without manure, 598 lbs.

Difference in favor of guano, 78 lbs., equal to 150 per cent. on cost of guano.

Experiment 6th.—300 lbs. guano per acre made 1313 lbs.; without manure, 568 lbs.

Difference in favor of guano, 715 lbs., equal to 238 per cent. on cost of guano.

BLUE DAHLIAS.

"The *Gardener's Chronicle* says that a celebrated cultivator of dahlias expects in a year or two to produce a blue dahlia, by keeping constantly watered the root of a white one with a solution of sulphate of iron. The sulphate of iron turns hydrangeas blue, and why not other flowers as well? Of course the solution must be very weak when used. Try it."

This idea of coloring flowers seems to be an *epidemic* in these days. For ourselves, we have no faith in it. If a given plant can be thus operated upon

by this means, with success, we do not believe it would be permanent. The next generation would not follow in the footsteps of its immediate, but of its remoter ancestry; and if but a single plant is affected, and for a single season only, the color desired may be imparted *in effect*, by covering it with colored glass, just as blue and red and yellow lights are obtained in our shop windows.

A SPEAKING TELEGRAPH.

It is mentioned in a late Paris paper, that at a private réunion in that city, a very curious system of telephony, for the transmission of language at great distances, by means of musical sounds, was exposed by its inventor, M. Sudre. The plan is most ingenious, only making use of three notes placed at given intervals, and which, combined or repeated according to certain rules, are capable of rendering the most complicated sentences. Thus, one of the company writes a few lines, and on M. Sudre reading them, he strikes his three notes alternately, according to his method, when a third person, without any previous knowledge of the writing, repeats the words merely from hearing the notes. The system has been, it is understood, tried on a very extensive scale, to test its applicability to naval and military purposes, and is stated fully to justify the high encomiums the Institute and other scientific bodies have bestowed on it.—*Exchange paper.*

The plan above described seems to us nothing more than a change of form of a custom long in use in military, if not in civil matters. The bugle has long been the medium of communicating orders from the officer in command, and is one of the means most relied upon in battles and elsewhere for their rapid and safe transmission.—Eds. P. L. and A.

THE CURCULIO: WATCH HIM.

Now is the time to commence your attack on this enemy of the Plum Grower. A writer in the *Farmer's Journal* gives the following as his experience in ridding himself of these "insects:"—

"Ignorant of the character of the enemy of my fruit," says he, "I determined to try an experiment with one of my trees. I accordingly procured a pound of flour of sulphur, and placing a small iron furnace filled with live coals on a high stock, as near to the lower branches as I could with safety, sprinkled the sulphur lightly on the coals. This was early in the morning, while the atmosphere was perfectly calm. As the fumes of sulphur ascended through the tree, I watched closely, for the purpose of ascertaining whether any effect had been produced upon my unknown foe. Scarcely had the vapor arisen to the topmost branches, when I observed several round-looking objects falling. Upon examination, I found them to be insects which were entire strangers to me. I showed them to a friend somewhat skilled in entomology, who at once pronounced them to be the dreaded curculio—the scamps that had the preceding year destroyed my plums.

"Much delighted with the discovery, I immediately renewed the sulphur fumigation, continuing it for more than a week, and always with success against the foe. The result was most gratifying. The tree which had been fumigated bore me a fair crop of excellent fruit, while on the other scarcely a single plum came to perfection.

"This spring my two trees blossomed profusely. I again caused the sulphur

to be applied, and at the period of writing, I am rejoicing in the prospect of a fine crop of plums."

C. Betts, of Detroit, publishes the following in the *Albany Cultivator:*

"Here is a remedy for the curculio which proved entirely successful in the garden of one of our citizens.

"As soon as the fruit began to form, and the curculios were found to be about the trees, he took a barrel of air-slaked lime into the garden, and with a large shovel threw the lime among the trees, covering them completely, and, to use his own expression, 'making a *perfect smudge.*' At this they seemed displeased, and left; he observed them crawling over the lime-covered fruit in a few instances, but they appeared restless and uneasy, and soon all left. Along in June they again made their appearance, and the liming was repeated, which was again successful in driving them away; and once again, just before the plums began to ripen, he gave the trees another dose, having observed some curculios about. His trees were loaded with fruit, while there were but few grown elsewhere in the city. A large branch, loaded, was exhibited at the August exhibition of the Detroit Horticultural Society. I have no doubt this course would prove successful if thoroughly tried, and where the trees, as in this case, are sheltered from violent winds."

HOEING CORN.

THE *Granite Farmer* talks wisely, we think, when it says, as in a late number, "Some ask how many times it is best to hoe corn and other crops. The best answer to that question was given us a few days since by a farmer whom we had observed often at work in a field of corn in sight of our window. In going over the piece with him, and remarking the remarkable growth, we asked him how many times he usually hoed his corn. 'Why,' said he, 'I do as I was brought up by my father to do. He never had any particular number of times, but hoed it all he could. I find it grows faster, and stands dry weather better, the oftener it is hoed.' This is the true philosophy of culture: stir the ground. The direction for early and good crops, after the proper previous preparation, would be, to stir the ground. Crops are like animals—they need petting and care. A friend was remarking to us, one evening, the difference in the growth of melon vines in a neighbor's garden and in his own, side by side, of the same kind of soil, and both rich; with the same kind of preparation for the seed, and the seed sown at the same time. The neighbor's melons were in blossom, while his own, he said, were but three or four inches in height. The difference had been produced by the constant labor and care of the gardener in stirring the ground and regulating the amount of sun and shade, air and moisture they received."

CURE FOR A FOUNDER.—The Ohio *Cultivator* gives the following recipe for curing the founder—more correctly speaking, the water-founder: Bleed the horse from the neck as long as he can stand up; then make him swallow one pint of salt; anoint well around the edges of his hoofs with spirits of turpentine; keep him from drinking too much water, and he will be well in a few hours. The writer says: "The above recipe cured a valuable horse for me, last spring, after trying nearly every other remedy without success. The six dollars paid for the back numbers of the *Cultivator* has saved me a horse worth upwards of $100: otherwise he must have died.

Hoofail.—Says another writer in the same paper: "This disease is usually attributed to driving on hard or muddy roads; but we have seen it in its worst form where cattle scarcely left the barn during winter, and having all the appearance of an epidemic. So severe was the disease that the feet of the animals affected became livid, and finally parted at the lower joint, as if the feet had been frozen. The best remedy in our experience is, on the first discovery of the disease, to drive the animal upon a plank floor, and with a broad chisel and mallet cut off the points of the hoofs to produce a flow of blood. A cleansing wash of weak brine, followed by an ointment of corrosive sublimate and lard, will be found beneficial. The animal should be kept from going in mud or water.

GRAPE CULTURE.

In the February number of *Hovey's Magazine of Horticulture* we find a communication from a successful grape culturist in Maine, Mr. Wm. Gore, of Freeport, who has succeeded admirably in the cultivation of the Isabella grapes. Mr. Hovey pronounced some specimens of this variety, raised by Mr. Gore, "superior to any he ever saw." By request of Mr. Hovey, Mr. Gore communicates his method of cultivating the grape vine on which the specimens were produced. We extract the following particulars from the Magazine in which it was published:—

"The vine on which the sample bunches were grown has been planted in its present place six years, and trimmed the usual way, the growing season, and 'spur' pruned in the fall. In the autumn of 1851, the vine had five canes, (or branches,) from fourteen to eighteen feet in length; but one being somewhat injured by mice the preceding winter, and the canes rather too near together on the trellis, I cut it off, leaving four canes, which, after covering the ground well with stable manure and boards, were loosened from the trellis, let down upon the boards, and covered with spruce limbs for the winter. In the spring, the vines were uncovered as early as the season would admit—early in April; but they were left down until the last of May, as they suffer less from the cold winds in that position than they would upon the trellis; besides, it is supposed the sap flows better through the canes, and consequently that the leaves put forth more uniformly. After securing the vines upon the lattice, which is twelve feet high and twenty-five feet long, at the south end of the house, and eighteen inches from it, I commenced weeding it, leaving but one shoot or fruitful branch to each eye or joint, and these were secured, from time to time, as they advanced to the trellis.

"The flowers did not make their appearance till the 2d of June; and the middle of July, the fruit being formed, I took off all but two bunches from every strong shoot, and reduced others of weak growth still more.

"I have been in the habit, before last season, of shortening in the young fruit wood at the second leaf or joint above the fruit; but the present season I have let all grow, excepting such as injured the symmetry of the vine—they growing from five to twelve feet before September, when they were all shortened in about one quarter of their growth.

"The fruit was gathered on the 20th of October, having been protected from the cold winds and frost one month by an awning of cotton cloth.

"I have pruned again this month (November) as usual, cutting all the fruit wood, or nearly all, to within one or two joints of the main canes, leaving the canes prolonged from eight to twelve, and put the vines under cover as in the previous year.

"I should mention that I watered freely in the first of the summer with soap-suds, and syringed often towards evening with rain-water. The summer packings or weedings [prunings] are buried by the roots of the vine, with a good sprinkling of plaster, and by the first of August *mulch* well about the vine."

Mr. Hovey, who is an experienced nurseryman and horticulturist, as every one knows, approves of Mr. Gore's method of treatment or culture of this vine, and sums it up as follows:—*Thorough weeding* of the young growth—*protecting the vine* during winter—*allowing a free growth* all summer—shortening in the new shoots only one fourth their length—early watering, and syringing freely during the season, and mulching after August when the fruit is rapidly swelling.

ABORTION IN COWS.

The able Editor of the *Cultivator* says:

"Without being able to assign the cause in this particular instance, we can only state what are usually regarded as the most prominent causes, viz.: confined or impure air in stables, stall feeding without sufficient and regular exercise, impure water, bad hay or stale grain, &c., which are supposed to cause flatulency, and increase the danger. Offensive odors, especially of putrid flesh or putrid blood, are supposed to produce a nervous influence, and strongly to contribute to this result. The ergot of rye is known to have a powerful tendency in the same direction, and it is thought that the ergot which grows upon other plants, as some species of grass, on wheat and Indian corn, and which are found more abundantly in certain localities and in certain seasons, may also tend to produce abortion. All the cows of a herd being alike affected by all these causes, when the first animal loses her calf, the peculiar odor which she imparts, and which the others by their keen sense quickly perceive, tends powerfully to produce the same disaster throughout the herd.

The remedy consists in avoiding all the exciting causes, and in moderate and regular feeding, wholesome food, pure water, pure air, moderate exercise, clean bedding, currying, and general attention to comfort."

WHAT IS THE BEST MODE OF CASTRATION?

The *London Veterinarian* contains the following advice, written by a veterinary surgeon of the King's Hussars:

Which is the best mode of castration? If you ask this question of five or six men, you will probably receive as many different answers. I have tried the actual cautery, the clams, the ligature, and scrapings; and I prefer the last, it being simple, safe, and speedy.

You have, doubtless, tried it, and perhaps most of your readers have performed the operation. However, at the risk of telling a twice-told tale, I will endeavor to describe *the mode of scraping*. You begin, as for castration, in the ordinary way. Free the testicle, and grasp it with the left hand; *divide the seminal* part of the cord, and with a tough-edged knife *scrape* the *vascular* cord lengthways, until you scrape through it. Simple enough, and speedy too, since from first cut to last scrape takes rather less than twenty seconds. I have done it in sixteen, and safely; for I never knew a horse bleed more than I wanted, and you have a simple wound, without any foreign substance to deal with. The horse stands quiet for nearly three days, being

merely rubbed down. On the third day the coagulum is washed away, and the parts cleansed, and nothing more is required after than to continue to keep them clean. Tetanus is *not* a frequent sequel to castration; though I saw last month you had put a (?) after what I wrote. As to the time most likely for an attack, I have always found it to come on just as the wound has healed, no matter in *what* part of the body it may be. Those attacks arising from castration generally manifest themselves from the fifteenth to the twentieth day; but I have seen them both earlier and later. As a rule, I do not castrate during the hot months, nor during the heavy rains. Wounds and ulcers generally take on an unhealthy action at those seasons, and particularly during rains. But I have operated in every month of the year.

Will Mr. Gavin excuse me if I say, in any future cases of tetanus, "use *camphor*." I think he will find it one of the most useful medicines. He will, I venture to say, agree with me, that blisters are of no use in tetanus.

SMALL VERSUS LARGE HORSES.

THE arguments may all be in favor of great size, but the facts are all the other way. Large horses are more liable to stumble, and to be lame, than those of middle size. They are clumsy, and cannot fill themselves so quick.

Overgrown animals, of all descriptions, are less useful in most kinds of business, and less hardy than those of a smaller size. If theory is to be resorted to in order to determine such questions, we suggest to the lovers of overgrown animals the following: The largest of any class is an unnatural growth. They have risen above the usual mark, and it costs more to keep them in that position than it would were they more on a level with their species.

"Follow nature," is a rule not to be forgotten by farmers; large men are not the best for business; large cows are not the best for milk; large oxen are not the best for travelling; large hogs are not the hogs that fatten best; and large hens are not the hens to lay eggs.

Extremes are to be avoided. We want well-formed animals, rather than such as have heavy, large bones. Odd as it may seem to the theorist, short-legged animals invariably prove to be better travellers than any. Short-legged soldiers are better on a march, and the officers say they endure hardships longer than those of longer limbs.

In choosing a horse, take care by all means that his hind-legs are short. If they are long, and split apart like a pair of dividers, never inquire the price of the horse-dealer; run for your life, and make no offer, lest you be taken up.

Horses that are snug-built are not always fast travellers. It is no easy matter to select a horse that is perfect in all points. Snug and tough horses are not fast on the road. The fastest trotters are not always made for very hard service. So says the *New-England Farmer*, and we agree with him.

IRON SCYTHE SNATHS.—Inventors and manufacturers of machines could have learned much, if they had only given attention to the extraordinary examples of contrivance so numerously displayed in the works of creation. We may cite achromatic lenses as one example of this sort, which even Newton pronounced impracticable, while at the very moment he was writing that assertion he was looking through two most perfectly constructed achro-

matic lenses, just like millions of others which had been in existence for thousands of years. The ancients were puzzled for a substance to write upon—wasps had been making paper since the creation—a crude, brown fabric, to be sure. Flies and tree-frogs had for the same period illustrated practically the pressure of the atmosphere, and the principle of the suction pump, with beautifully constructed miniature machines; and the structure of the arch, which the more ancient nations, notwithstanding their superlative skill in masonry and architecture, knew nothing about, was well understood and constantly practised all that time by a little mining ant. The most perfect form of a rod, shank, or beam, to combine strength and lightness, is illustrated by the tube of birds' quills, and by the straw of grains and grasses—the hollow rod or tube. This principle has been already applied in a number of instances; but not till now, the middle of the nineteenth century, has the hint been taken in the construction of scythe snaths,—implements in which lightness and strength are preëminently required. We observe by the Patent Office records, that these have been successfully manufactured by A. C. & C. N. Clow, of Port Byron, N. Y., and learn that they promise great advantages on the score of durability, strength, lightness, and facility of being bent into any desirable form.

FLAX MANUFACTURE.

The American Linen Company at Marcellus, N. Y., was originally organized in October, 1851, with a moderate capital. Last summer they demonstrated the practicability of producing linen yarns for about the cost of cotton yarns, and the capital stock was increased to $100,000. The woollen factory of Messrs. Machan & Moses was bought with the view of introducing gradually flax machinery.

From experiments already made in the use of machinery and processes invented by the Secretary of the Company, and some machinery imported from England, the following results are obtained:

The cost of breaking and cleaning unrotted flax-straw sufficient for 100 pounds of pure flax fibre, is less than $2.

Cost of refining, purifying, bleaching, and preparing the same for heckling, by the use of four machines, recently invented for the purpose, and a chemical process, about $1.

It is found that the very expensive process of heckling in the ordinary way can be dispensed with by the use of a machine recently invented, which takes out only the shortest fibres and impurities, leaving the heckled and purified flax in the sliver form, ready for drawing-frames, for less than two cents per pound.

The tow or waste taken out by this, consisting entirely of the short fibres of flax, with such impurities only as are easily separated by picking and carding, is suitable for combining with wool, being fine, white and strong. It is far better for this than cotton, which is now extensively used in tweeds and other mixed goods.

The coarsest flax, such as is grown extensively in this country for seed, is rendered quite as fine and soft as the fine flax straw; and even hemp, by this new mode of manufacture, is capable of being made into fine linen.

Great improvements have been made in drawing-frames, by which they are made to cost much less than the English, while they will do about double the quantity of work, and in the most perfect manner. The roving and spinning-frames have also been greatly improved.

Unrotted flax-straw, in great abundance, can be procured here, after the seed has been taken off, for $10 per ton, and at the West, cheaper still.

The American Linen Compan yexpect to be prepared to supply a large amount of machinery the coming season, either for manufacturing linen, cordage, or bagging by the use of either hemp or flax.

To these statements, which are condensed from the *Tribune*, we append the following from the *Agricultural Society's Journal:*

All the rain that falls upon our fields must either be carried away by natural or artificial drainage, or, having thoroughly saturated the soil on which it falls, be left upon the surface to be carried off by evaporation. Now, every gallon of water thus carried off by evaporation requires as much heat as would raise five and a half gallons from the freezing to the boiling-point. Without going to extreme cases, the great effects of the heat thus lost upon vegetation cannot fail to be striking, and I have frequently found the soil of a field well drained, higher in temperature from 10 to 15 degrees than that of another field which had not been drained, though in every other respect the soils were similar. I have observed the effects of this on the growing crop; and I have not only seen a much inferior crop on the undrained field, but that crop harvested fully three weeks after the other; and the setting in of unsettled weather, I have seen that crop deteriorated fully ten per cent. in value.

MAPLE SUGAR.

"An intelligent farmer in Waitsfield, Vt., has discovered an effectual method of removing the coloring matter from maple sap, so that it will make sugar nearly as white as common crushed sugar. His method is to filtrate all his sap, before boiling, through a hopper or box of sand, which he says takes out not only all the dirt, but all the stains derived from leaves, tubs, crumbs of bark, and all other coloring matter that can prevent the sugar from being pure and white."

This little piece of intelligence is cut from one of our exchanges. But it is all gammon. Years ago, we saw specimens of maple sugar at the Windsor County Show, made in Woodstock, as white as loaf-sugar from the cane. In fact, most of the sugar used in Vermont is of domestic manufacture, and that used in their own families is often far more free from impurities than are the imported sugars. We could give names of the makers of some of these beautiful specimens, which date as far back, at least, as 1846. This, however, is a fair sample of many of the "new discoveries" of our times.

GRAPES FOR COLD-HOUSES.

J. Fisk Allen, of Salem, Mass., widely known as a most skilful cultivator of the grape, succeeds admirably, by means of his forcing, cold, and retarding-houses, in furnishing a supply of this delicious fruit during the entire yearly circle. Forcing grapes, so as to ripen them by the first days of summer, and raising them in cold-houses, for a supply throughout autumn, are well understood and commonly practised. A retarding-house, for winter ripening, and for keeping them hanging upon the vines in safety till wanted, is a greater rarity, and it may prove very desirable with those who shall attempt it, to know what sorts do best for this purpose. The late Report of the Fruit Committee of the Massachusetts Horticultural Society furnishes the following list for this purpose, from Mr. Allen, which he states is the result of ten years' experiments :—

Those which continue fresh or without drying in the retarding-house, are Prince Albert, Queen of Nice, Syrian Porteau Noir, Black Portugal, Whortley Hall Seedling, Muscat of Alexandria.

Black Hamburg, Wilmot's New Black Hamburg, and Victoria Hamburg, dry up some.

The following dry badly:—All the Fontignans, Black, White, and Grizzly, and Zinfindal; Black St. Peter's is uncertain.

We have seen much of Mr. Allen's fruit, and are confident that he deserves the commendation given him in the foregoing paragraph from the *Albany Cultivator*. The regard him as one of the most intelligent and most successful fruit growers in the country.

CHURNING SWEET CREAM.

Mr. True, writing from Phillips, Me., for *The Soil of the South*, says:

"Milk should be strained as soon as convenient after milking, and agitated as little as possible, so that, while cooling, it may commence throwing up the cream undisturbed. The cream should be skimmed off while the milk is sweet, and be sure that the milk is not allowed to go in with the cream, for it will sour and curdle, which will be seen in the butter in white streaks, that many cannot account for. Cream should be churned when sweet, and while cool; the buttermilk drained off, and cold water put into the churn, and churned a little, then drained off, and some strong brine put in, and worked again; because the water will turn the butter white, if allowed to remain. When it oozes out, it is better to work it in the churn than to work it by hand, for it prevents its being greasy, which hurts the sale and flavor very much.

One or two spoonfuls of salt to the gallon of cream will prevent its becoming bitter in a great degree.

A piece of saleratus, the size of a walnut, to the gallon, when the cream is bitter, or frothy when churning, will be of great service.

Do not put sugar into your butter, unless for immediate use.

Salt according to the market which it is designed for, but not very salt for any.

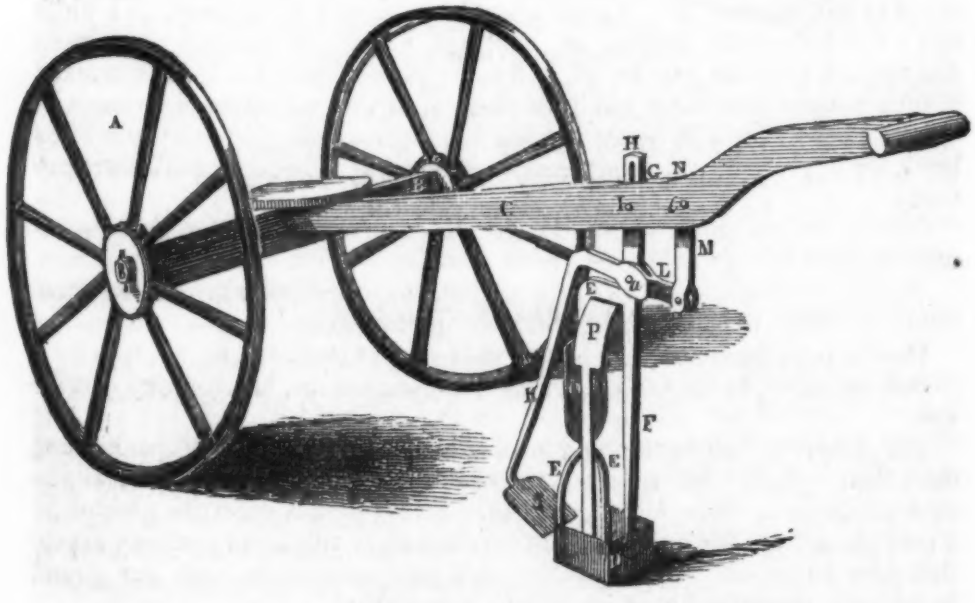
Put a layer of salt in the bottom of the tub, then a cloth; fill within one inch, then a cloth and salt; be sure that the cloth does not come over the sides of the tub; cover with a good tight cover; keep it from the ground, in a cool place, from the current of air. Follow these rules, and you may expect that your butter will be sought after, and from one to ten cents per pound in advance of a common article will be your reward.

VALUE OF GUANO.

At a late agricultural meeting, Hon. Marshall P. Wilder being called upon, made the following remarks in regard to guano: He believed that at the present high price of labor, the cost of barn-yard manure on a piece of land would exceed that of an amount of guano sufficient to produce an equal crop. He considered it the very best kind of manure. It always succeeds best in a moist climate, and hence the immense quantities introduced into England, where $8,000,000 per annum is expended for it. Mr. Wilder related some instances of its great fertilizing effects. Mr. Venable, M. C. from North Carolina, had communicated to him the results of its use upon his farm. He had

several thousand acres which he regarded as hardly worth cultivation. He applied guano to it, ploughing it in deep, at the rate of only 150 pounds to the acre; and from the whole of this land he obtained an average of 23 bushels of wheat per acre; whereas before applying the guano he got only 5 bushels. Another instance was that of Mr. Holcomb, of Delaware, who purchased a farm of 2300 acres, with a brick house thereon, for $2500, owing to the miserable condition of the land. He sowed 75 acres of it with wheat, ploughing in about 10 tons of guano; and the first crop paid for the farm and all its expenses, and left a small surplus besides.

Mr. Wilder's plan was to compound one part of guano with six parts of meadow mud, pulverizing it, and adding another part of charcoal; placing it in a heap (which must be kept covered) three weeks before using it. He had found by experiment that half a handful of this compost was as good as a whole handful put in dry. In sandy soils it should be placed pretty deep, but in clayey lands, shallow. It should be applied early in the spring. Seven years ago he reclaimed a piece of meadow, and dressed it with 300 lbs. guano to the acre. The first year the crop was so heavy that it mildewed, and had not been obliged to renew it.

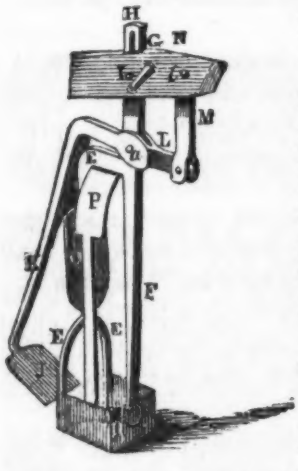


MORRILL'S IMPROVED DITCHING MACHINE.

This engraving is a perspective view of a ditching machine, patented by Jonathan W. Morrill, of Hampton Falls, N. H., May 10th, 1853.

A A are the wheels; B is the axle of the same, across which the beam lever, C, is secured. The cutters for ditching are placed and secured in this lever. D D D are the cutters for cutting the sides and front edge of the sods. These cutters are united together, and are braced and supported by the stirrup brace, E, which has a vertical bar, F, secured to the front edge, and passes up through the slot, G, in the lever, C. This bar, F, has a slot, H, cut in its upper end with a pin, I, passing through it to make it fast to the lever. As the cutters are raised and lowered, the slot in the bar, F, admits of the lever, C, being depressed and raised. J is a spade, cutter, or scooper; it has a bent

handle, K, L, which turns on a fulcrum pin, *a*, which passes through the bar, F. The part L is secured to a link, M, which passes up through a mortice, N, in the beam, and is loosely secured in the same by a pin, *c*, which it allows to move back and forth, as the cutters, D D D, and spade, J, are depressed or elevated. O P are thin plates of metal for guiding the sod as it is raised up, and for throwing it out at the side of the ditch. The plate, P, is only to incline the sod to the one side.



Two men take their position at the handle of the lever, facing the wheels. They press down the lever, which causes the spade to fly out, at the same time cutting the sod on three sides; then, raising the lever, (without changing their hold,) forces the spade in, cutting the sod off at the bottom. The machine, being now on the surface, swings forward seven inches, when the same operation is repeated, one sod pressing out the other, throwing them upon the side of the ditch. Or the lever can be extended across the axle, a man working at each end.

The machines can be made to cut ditches one, two, or three feet deep, and seven inches wide, or fourteen or twenty-one inches wide, by going over the ground twice or thrice, or wider by repeating the operation. It is comparatively easy work for two men. It is fitted to the large wheels of a single-horse wagon.

It may be used to good advantage without the wheels and lever, by having attached to it a piece of wood two feet long, with handles, as represented in the small cut. It cuts a ditch smooth on the sides and bottom.

Applications for machines or rights may be made to the patentee as a

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COPPERPLATE PRINTING.

Few persons have correct ideas of the manner of accomplishing this important work. The engraving, the plate from which the picture is produced, is not so rare a sight; almost every body has at least seen a simple form of it in the plate of an engraved visiting-card, which may be taken as a sample of the whole. Unlike the process of printing, the ink is suffered to remain only in the *cuttings* or "lines." The smooth parts of the surface are intended for the white or uncolored portions of the picture. Hence, after the plate is thoroughly covered with the ink, it is carefully wiped, for the purpose of removing all the superfluous ink, leaving only the "lines" or sunken parts blackened. After it is thus prepared, the plate is covered with the paper on which the impression is to be taken, which should be slightly damp, as it is also in printing. On this sheet are laid several thicknesses of cloth, when the whole is passed between two rollers. These rollers may be made of very hard wood or of iron. The "impression" is the result of the elasticity of the cloth, which forces the paper upon the plate into the lines, absorbing the ink contained in them, which adheres to its surface, leaving the plate comparatively clean. This process may be repeated at pleasure, till several thousands of copies are obtained. The earliest impressions, however, are the best, and are called "proof impressions." Even a moderate use will affect the condition of some of the sharp lines or edges, so that an experienced eye readily detects imperfections. These impressions are also taken with more

than ordinary care. On this account they command a higher price than is obtained for impressions taken after the plate has been worn by use, or when less care is taken to secure the best possible impression.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

AGRICULTURE: ITS USEFULNESS, ANTIQUITY, DIGNITY, AND PROGRESS.

As a farmer was sitting under the hands of his hairdresser, and the latter was tying up his queue, or what is vulgarly denominated a pigtail, which then was almost universally worn, he asked the agriculturist what was the difference in each other's occupation, to which the farmer replied in one word, viz., *utility*; i. e., you till.

The command the Creator gave to Adam in Eden, is well worth being borne in mind by the tiller of the soil in the present day. The injunction given to our great ancestor was, "to dress and to keep it," from which we gather that the working of the soil was an occupation from the very highest authority, was deemed truly honorable, and the employment of tilling the ground was neither degrading nor humbling, but doubtless conducive to health, happiness, morality, and independence.

No employment or profession can boast of more numerous or more noble patrons than that of agriculture. From the most ancient records, tradition and history have handed down to us names high among men, who have not been merely patrons, but partakers of the labors and toil of the husbandman, and thus have sweetened their repasts, softened their nightly couch, and given a higher zest to all the enjoyments of life.

We read in Holy Writ, that Uzziah the Jewish king was fond of husbandry; that Elisha was found ploughing with twelve yoke of oxen, when Elijah summed him to bear the prophetic office; and Gideon was threshing his grain when God deputed him to drive the enemies of his country back into their own territory.

Cyrus, the great Persian king, often worked his garden with his own hands, and was extremely fond of horticulture. Cincinnatus was found by his distressed countrymen driving the plough, from which he was called to direct the destinies of the state, and when he had saved it, returned joyfully to the same manly occupation.

And at the present day it is customary for the Emperor of China always, one day in the year, to take hold of the plough and turn a few furrows, that he may honor the labor of the field, and thus give it his royal sanction in the eyes of his numerous subjects.

The Romans gave the name of *pecunia* to their *coin*, which literally means *cattle*, thus showing that they regarded the produce and care of the field as the only real wealth of the country, as it ever has been, and must ever remain so.

It has been justly said, Stop the plough, and you will starve the world. And no greater truth has ever been uttered. We may ransack the bowels of the earth for the precious metals, invent all sorts of machinery, build steam vessels, and erect telegraph lines; but all these mighty developments of the human intellect must yield to the more ancient and indispensable usefulness of the plough. It is the main-spring by which all other arts and occupations become effective.

If we reflect upon the improvements which have been made in agriculture,

no one calling or profession can boast of greater progress. The time was, when a limb cut from a tree served the purpose of a plough; and the classic phrase of Virgil was truly descriptive, *curvum aratrum;* and a bough cut from the same took the place of the harrow.

When our missionaries in southern Africa introduced the plough at their stations, and the wondering chiefs saw how rapidly and neatly it turned over the soil, they declared that every plough was worth twelve wives, as the labors of the field among these savages were altogether performed by the females.

The great increase of produce per acre obtained by the scientific application of artificial and natural manures, and the practical knowledge spread abroad by our agricultural papers and Societies, attest the rapid advance that has been made in every branch of field occupation.

When conversing with farmers in the mother-country, the writer has often heard the remark that now he could graze and fatten as many sheep as he occupied acres of land, while the generation before dare not venture to keep half that number upon the same homestead.

The hop and the broom-corn are two remarkable instances of progress, and also of what great effects result often from trivial causes. The former, not many years ago, was proscribed by the British Government as a plant whose properties were pernicious, and prohibited from being cultivated; but it has now become a staple commodity, pays an immense tax, gladdens the hearts of the peasantry, and furnishes employment for thousands of her hardy sons.

Whisk in this country was first raised by Franklin from a single seed, which he took from an imported broom and planted in his garden. The Canada thistle, of which so great complaint is made, and which our Legislatures have endeavored to prevent from spreading by enacting penal laws, was introduced by an emigrant emptying his straw bed, in which were some of the downy seeds of this hardy weed. This is a plant exceedingly difficult to kill, as it has a single tap root, which runs down to an amazing depth, and nothing but deep and frequent ploughing will exterminate it.

Where this plant luxuriates, the land is generally good, and the elm tree is often seen to rear its branching tops in the same vicinity, as both seem to find a congeniality in the same kind of land. A blind man once took a boy with him to visit a farm which he had a desire to engage, and when arrived in one of the fields, told the boy to tie his horse: the boy replied, he could find nothing to fasten him to, except a thistle, of which there was an abundant and a luxurious crop. The blind man, hearing this, made up his mind to engage the land, declaring that if it would grow thistles, it would grow any thing he chose to plant upon it.

To a studious, inquiring, and a philosophical mind, the occupation of the field, the rural scenery of the country, and the care of the various animals which collect around the farmer's homestead, afford the most abundant matter for observation and experiment. Here, the botanist, the naturalist and the chemist are surrounded with favorable opportunities for the gratification of their taste to any extent. The habits of the feathered tribe alone yield a theme which is always interesting, nor need we feel alarmed at the increase of these winged songsters, as it has been proved beyond controversy that they are a blessing rather than an evil, by destroying the grubs and the insects which would otherwise eat up the produce of the soil.

The writer once kept for years a large tame-male buzzard hawk, whose use in the garden was of no small amount. No fowl from the yard dare venture

within the limits of his domain, and even strangers of the human species had to be guarded when they ventured there without some of the family. He has been seen to chase and kill a weasel with dexterity and dispatch, and when any of the ground was dug, Jack was always in attendance, devouring the worms which were turned up by the spade. In the spring he generally built a nest in one corner of the arbor, and would shriek with a loud, shrill voice for a mate; but having his wings always clipped, he was unable to make any visits to the lady hawks, and thus was obliged to waste his days in single blessedness. One morning, he was found dead in the garden, but not cold: some thieves had entered it during the night, and by a blow had terminated the life of this faithful guardian, over whose remains the writer ought to have written an epitaph, as Cowper did over his hares.

It is pleasing to observe that agriculture is beginning to be thought essential to a complete college education. This would have a tendency to remove that odium which many of our youth feel towards a country residence. Many a clergyman and men of other professions have sighed for the time when, after long years of service, they might retire and pass the evening of life in some quiet spot in the country, but have been disappointed because of their ignorance of the proper management of rural affairs.

We want writers also who will interest us in the avocations of the field. It is well to have philosophical digests of agriculture, but the poet and the essayist should use their pens to make the subject captivating. R. S.

Madison, N. J., May 24th, 1853.

FARM FENCES.

The best fence is a good stone wall; but if wood is used, skill and judgment are necessary in the selection of the material and the mode of preparing it.

The first item for consideration, in this matter, is *first cost*, and the second is durability. Sometimes a third item may be important, to wit, the land used up by the fence. The second is the only one of these that can be estimated with any degree of accuracy by any general formula, and even this one is far from being uniform. But let us say a word of each.

1. The stone wall. If material is at hand, on or in the soil, and no especial obstacle or objection comes in to vary the result, our own opinion is decidedly in favor of stone fences. When properly laid, they outlast the builders. We know of fences of this kind, apparently as good as new, that have stood at least fifty years. These samples are chiefly of faced walls, with deep foundations, costing originally two or three times as much as an ordinary fence. But if they last as they now promise, the amount expended in their construction was a capital investment. We remember many miles of stone wall in our native place, which have stood an equal length of time, but which have needed occasional renewal or repairs. Portions have been thrown down, and were of necessity rebuilt.

It is well known that, in most parts of New-England, stone wall is the prevailing style of fence, both on the highway and for dividing lots; and in all that region with which we are well acquainted, we have never known a farmer who did not prefer stone to any other material for this purpose.

To secure durability, the foundation should be placed below the action of frost, and the whole should be laid by a skilful man, so as to secure to the greatest extent the aid of gravitation and friction in resisting all violence from

either side. When thus laid, this fence is a good security against domsetic animals of all sizes.

But sometimes stones are scarce, and timber is very cheap, while labor may also be expensive. So it often is where pine barrens or other forests abound. There is also a great difference in the *amount of defense*, so to speak, which is required. Sometimes, it is chiefly a mere landmark to point out a highway, and some of the oldest parts of New-England furnish evidence that even this is unnecessary. The path beaten by the hoofs of horses or oxen, and worn by the friction of wheels, is the only index of the existence of a road, while nothing but a marked tree or a post or stone, indicates a plurality of owners of the soil. Such regions of country, however, furnish no occasions for the application of any general rules on this subject.

As to wooden fences, cedar, no doubt, is the most durable of all woods, and where it is abundant, so as to be cheap, should be preferred, especially for posts.

All woods are made more durable by being charred before they are set in the ground. Decay or decomposition is a chemical process which requires the presence of certain elements which in charcoal are essentally wanting. Charcoal, we suppose, is never chemically decomposed by exposure to the air or water. It may crumble. It may be attacked in certain situations by elements not generally encountered. It may absorb moisture, so as to be broken by frosts, and the like; but still charring well pays its way, when timbers are to be set in the ground. But they should not be charred so extensively as to weaken materially their strength.

Many experiments go to prove that the smaller end of timber should be set downward. The rationale of this is rather hypothesis than physiological demonstration, since we know of nothing which has been actually discovered, which implies an upper or under side to the circulating vessels which compose the wood. The tubes and cells present similar appearances at each extremity, though their form or shape, tapering or otherwise, may have an important bearing on this phenomenon.

Saturated solutions of corrosive sublimate, sulphate of copper, acetate of iron, and creosote, prevent the decay of timbers: so does tannic acid and an atmosphere of carbonic acid, however obtained. Pyrolignate of iron is also efficient and economical, as well as melted tar. On the other hand, alkalies and alkaline earths facilitate decay. Hence the character of the soil in which posts are to be set should be considered, and if unfavorable, foreign materials should be used in filling in around them. The deposition of insoluble gypsum in the body of the wood is a very efficient mode of preventing decay. This process may be performed usually by immersing the end of the wood in a solution of gypsum when the tree is first cut, though it requires considerable time to secure the entire success of the experiment. The timber should also be thoroughly enveloped with it.

We might give an estimate of the cost of various styles of farm fence, as some of our contemporaries have done on kindred topics, but no one would perhaps be a safe basis of calculation, for one hundred miles square. Hence we leave the subject here, giving in a tabular form the items which each man must estimate for himself. These will vary, of course, with the season of the year, even on any given territory and for the same job. These items embrace the following:

1. Cost of material it, and of preparing it.
2. Cost of transporting to the spot.

3. Preparing the ground for the superstructure, whether a wall or posts and rails.

4. Cost and amount of labor to be employed.

5. Value of land affected by the fence, whether by occupying space or by casting shade.

As to the age of timber and the season of the year when it should be cut, to secure the greatest durability,—young, or at least sound timber should be selected, and the spring or early summer is probably the best time for cutting it. The latest growth will then have become somewhat hardened, and the condition of the sap at that time *is said* to be favorable to their remaining sound for a long time. We do not attach much importance, however, to that hypothesis.

Wire fences are not generally approved, so far as our observation extends. When wires are stretched across a cheap frame, they may be very convenient for enclosing temporarily a small plot of ground, but for a permanent fence they will not pay. If they are used, they should be confined in their place by passing through substantial wooden posts, sufficiently near each other to attract the notice of animals. For one objection to them is, that cattle do not see them, and hence they are exposed to a degree of violence, even from quiet animals, which will severely try their strength. Live posts, earthen or burnt clay posts, and the like, we regard as ingenious, rather than practically useful. They may sometimes answer well, but not as a general practice.

A fence the lower half of which is stone, and the upper half rails or wires, may serve a very good purpose, and where stone is scarce, it may be the best form of fence.

But, whatever style is adopted, let the materials be of good quality, and the work be done skilfully. Sham fences are among the most expensive forms in which a lack of practical skill in farming operations is often exhibited.

FARM WORK FOR JULY.

Hoeing-time is an important season for the young crops. The earth needs to be loosened: the young weeds will have grown faster than the seeds that were planted, and will steal the food that may be made to pay better than by growing into hogweed or any other of the pests of the field.

The growth of the young corn and of other crops may be improved by a slight sprinkling of a mixture of charcoal dust, plaster of Paris, and guano—the last being a small fraction of the whole, or say one part, by measure, of the guano to ten or more of either of the others, on the hills or around the roots. Charcoal is an excellent fertilizer in almost every kind of soil, and there is no danger of its doing harm, in any quantities in which it would be likely to be used.

Cultivators will be found very useful in the extensive operations of most farmers, though a skilful hand with a hoe does the work better than any labor-saving machinery can do it.

Haymaking is also close at hand. We gave our views very fully on this subject last year, and need scarcely repeat them here. The seed should be well formed, but not dried, before the grass is cut. Clover should always be cut before the flower goes to seed, and so should herds' grass, and all the other varieties.

There is such a thing as drying hay too much. All drying is in excess which is not necessary to preserve the hay in the mow. If it could be kept

sweet as it is cut, it would be much preferred by cattle to the same grass in a dry state. A slight sprinkling of salt tends to preserve hay on the mow, when not thoroughly dried, and it does no harm to the hay or to the cattle.

The earlier part of July is a drier season than the latter part, and should therefore be used by the farmer, as far as is possible, for the curing of his hay. We know a judicious farmer in Connecticut, whose acres indeed are comparatively few, but who took advantage of the seasons from year to year, so that he very seldom had his cut grass wet by the rains.

Fruit trees require constant attention now, to preserve them from the ravages of insects. Remove also the excess of fruit from your favorite trees at least, and from all if you have opportunity, and the fruit will improve in size and quality much more than is lost by the operation.

In severely hot and dry seasons, occasionally watering gardens is highly useful. We have tested this to our entire satisfaction. This should be done at night, and the whole of the water may be secured to the soil. If done earlier in the day, much of the water will evaporate. It should not be colder than rain-water.

Bulbs should be taken up soon after the flower is gone. Dry them carefully and keep them cool, but safe from frost, till they are reset. Tall flowers should be supported by stakes or frames, otherwise the stems may be broken.

Keep your garden walk clean. A little salt sprinkled over it, or brine poured upon it, will assist; and look out for thistles, &c., and not allow them to go to seed. Sow at your leisure green crops, intended for ploughing in in the fall. This work may be done at almost any convenient time.

Ley made from horse-manure is an excellent *tonic* for rose bushes, &c., if not used too freely. Forcing plants too much often destroys them.

Lastly, continue to add to your manure-heaps any sort of offal, vegetable or animal, that comes to hand; and if dead animals or other active agencies are found, add liberally of muck, or turf, or any thing in the shape of soil.

FLAX CULTURE IN INDIANA.

Mr. R. T. Brown, of Crawfordsville, in a communication to Governor Wright, President of the Indiana State Board of Agriculture, says:

"I send you enclosed a few samples of 'Flax Cotton,' presented to me by the Hon. H. L. Ellsworth, of Lafayette. Mr. Ellsworth has secured the machinery necessary for the manufacture of the cotton, and will have it in operation early in the season. He has on hand the 'stem' grown on 120 acres last season, which, from experiments already made, will, he supposes, yield about 300 pounds per acre of 'cotton' similar to No. 2 of the enclosed specimens. The expense of reducing the fibre to this state, after the stem is produced, is about two cents per pound, which, at the usual price of cotton, (10 cents,) will leave eight cents per pound, or $24 per acre, for the farmer who produces it. To this must be added the value of the seed, which will range from $6 to $8 per acre, giving a final result of $20 at least for each acre. This is Mr. Ellsworth's calculation: it may be too high; but if we allow for the magnifying effects of his zeal one third, or even one half, still flax will be as profitable a crop, in proportion to the amount of labor required to produce it, as any of the staples of the country.

"Mr. E.'s method of flax farming is to break his ground in the fall, and secure it from being trodden in the winter. Between the middle and last of April he harrows it well, sows his seed, harrows in, and passes the roller over

it, leaving a level surface. He harvests it with a horse-power reaper, cutting about two inches from the ground. As soon as it is dry, the seed is threshed off, (for which operation we yet need an appropriate machine,) and the 'stem' baled for transportation to the factory. The amount of labor is about the same as that required for a wheat crop."

ULSTER LEAD MINE.—STICKNEY'S IMPROVEMENTS IN BLASTING.

We lately embraced an opportunity of visiting the mine and works of the Ulster Lead Mining Company at Ellenville, and were much gratified at the state of the enterprise, and the judicious and prudent arrangements made for the economical and successful working of this mineral deposit. We had intended giving in our own words a full description for the information of our readers, but we avail ourselves of the Report submitted by Mr. James T. Hodge, as being a careful and accurate statement of the locality, capabilities, and probable productiveness of the mine. Mr. Hodge says:

"The Ellenville Lead Mine, recently opened at the foot of the western slope of the Shawangunk Mountain, in Ulster county, N. Y., is situated just without the village of Ellenville, eight hundred feet east from the Delaware and Hudson Canal. The mouth of the mine is about thirty feet above the level of the canal, towards which the ground slopes gently down. Above the mine the mountain rises, faced by a wall of rock, which slopes upward at an angle of forty-eight degrees with the horizon. This rock is known by the name of the 'Shawangunk Grit.' It is a coarse, grayish-white sandstone, hard and durable, lying in broad sheets, which repose upon each other at the above angle. The course of the mountain is N.N.E.—S.S.W., and the dip of the strata is towards the W.N.W. The vein containing the lead ore crosses these strata obliquely, running into the mountain in a direction S. fifteen degrees E., and inclining towards the north at an angle of seventy-eight degrees with the horizon. A portion of the vein, near the mouth of the drift, crosses over to the N.E. and takes a position between the strata of sandstone, dipping with them under the valley in front of the mountain. This portion has the appearance of, and is in fact, an included bed, but its connection with the true vein is apparent on examination. The metalliferous contents of the vein, introduced through and filling the vein fissure, appear to have been carried between the strata on the north side, forming there a collection of ore of uncertain extent. This bed is represented in the accompanying section at the point marked 'C.'

"Standing in front of the ridge, the outer edge of the vein is seen up the face of the rock for forty or fifty feet, sometimes presenting on the outside a thickness of several inches of galena, and sometimes shutting into a mere crack. It is accompanied by other parallel fissures or cracks, some of which, in the immediate vicinity, have been filled with quartz vein stones more or less metalliferous. All these running across the strata in one direction, no question can arise as to these repositories of ore being a system of true veins. Several of these veins are favorably noticed, as occurring along the Shawangunk Mountain, by Professor Mather, in his State Geological Report. (See pp. 358, 359, &c.) Sometimes they take the form of included beds, but, with rare exceptions, he found them all transverse veins. He expresses an opinion that valuable repositories of lead ore may be found along the range of the mountain.

FIGURE 1.

"The Ellenville vein was first opened by Captain Rickard, by an adit following its course, driven in from the base of the ridge. In the preceding section, (Fig 1,) drawn on the plane of the vein, *a* represents the western slope of the mountain. The parallel lines, *b*, the sandstone strata. The included bed of lead ore, already referred to, is seen at *c*. The drift *d* is run in on the line of the vein, which extends downwards along its floor, and its edge is seen up the slope *e*. *f* is the limestone formation, resting against the sandstone, and *g* the superficial loose earth and stones.

Figure 2.

"The position of the vein will perhaps be better understood as it appears in front, and sketched in Fig. 2, where *a* represents the vein of galena, and *a a* are parallel fissures.

"The vein, which on the outside appears as a mere crack, with some scattering quartz and galena, rapidly enlarges within, and between its sides are included large bunches of rich galena, intermixed with some quartz, blende, or sulphuret of zinc, and copper and iron pyrites. For a distance of several feet, the galena, nearly pure, was found from eighteen to twenty-four inches in thickness. At the end of the drift, some twenty feet in, the vein contracted again, but in the floor the ore still continued downwards, retaining its richness and width. To further develop it in this direction, Capt. Rickard very judiciously came back, taking up a stope, or level, five feet lower down, and this will be followed by another of the same depth, which is as low as can be conveniently drained. This is done preparatory to sinking, upon the vein near the edge of the hill.

"There being no question as to the value of the ore when extracted, the great point to be considered is the probability of finding a large available supply of it. We have seen that it occurs in a true transverse vein; and such veins never give out, however irregular they may be in form and production. Several of these veins have been, at various periods, opened and partially worked in the sandstone along the Shawangunk Mountain. They have all the peculiar features of productive veins of other regions; the same mixtures of gangue with different ores; the opening of cavities or 'vugs,' lined with quartz, crystals, and containing red clay; and the occurrence of this red clay, or 'flucan,' between the lode and one or both of its walls. Almost every thing concurs to the probability of this proving to be a valuable mineral district. More lime than lead ore has been usually found in the veins, and this has been the principal cause that the mining operations were not more extensively prosecuted. In this mine, so far as opened, galena is found to be the prevailing ore, the others being hardly more than noticeable. It is reasonable to expect this will continue so. No falling off of the ore in the floor of the drift was

found up to the time of my last examination of the mine, on the 23d to June. On the contrary, there was the greatest encouragement to look for a most productive lode in sinking below the level of the valley; and this I should strongly recommend, as well from the fact that veins usually yield best at some depth below the surface, as for the purpose of reaching the *limestone formation*, which under the valley will be found inclining against the sandstone, and the veins extending across them both. For it is the limestone that, in most places, is found to be the lead-producing rock, and this belt of it that is known to be along the valley, resting against the sandstone, is the continuation of the lead-bearing limestone of Wisconsin."

After considerable detail on other points, too general for our pages, Mr. Hodge says:

"With all these advantages, and the prospect of abundant ore, presented by the large quantity already taken out, I know of no new mine offering as great inducements for the investment of capital."

We give the above statements as printed by Mr. Hodge for the information which they contain, and without reference to any influence for or against the enterprise. We believe it to be important that our mining interest should be well understood, and for that purpose reliable statements from every source will be welcome to our pages.

Since Mr. Hodge's report was published, Capt. Rickard struck into a large cavern, lower down in the vein, by some twenty or thirty feet, than the drift represented in the figure, the sides of which are rich in the ore, while the vein, which we followed down the sides about forty or fifty feet, is solid galena, in some places two feet in thickness. The work necessary to lay this mass of mineral in a conveniently accessible position, by the clearing away of the superfluous rock, is vigorously prosecuted; and not a long time must elapse before the true value of the Ulster Mine will be ascertained with a fair measure of certainty. That a large body of rich galena, with a share of copper sulphuret, is contained in the vein, is beyond a doubt. The continuous vein of fifteen to twenty-five inches of pure galena is followed down the whole depth as far as gone in the cavern, while the structure of the rock is an indication of no little importance to the miner.

Since our visit, we learn that the Company have put their smelting furnace in operation experimentally, and that there is every reason to believe that the works will be fully equal to the demands of the undertaking. The washing and smelting-houses are plain, capacious, and fitted for the purpose; and we are glad to record the favorable auspices under which the Company appear to be prosecuting their labors. We trust that they will be abundantly rewarded.

At the time of our visit, Mr. A. Stickney, of Norwich, Vt., was at the mine, experimenting with his new mode of blasting, by operating in the very hard sandstone grit of this locality.

Mr. Stickney's method consists in drilling a hole in the usual way into the rock, and then, at the extremity, no matter what the depth of the drill, a hole is *burned* in the rock by means of fuel, and a current of air kept up by a bellows for the purpose. The tube attached to the bellows is an ingenious and admirable application of scientific principles, and eminently serves the design of the inventor. The hole burned gradually enlarges, and with the increased capacity, of course a larger quantity of fuel is admitted; and consequently a larger fire is kept up, the tendency being to a more rapid enlargement with each increment of fuel. The object of this cavity is obviously to afford a receptacle for a larger amount of gunpowder than can be contained in an ordinary drill, this cavity being formed in the only practicable mode by which

it can be obtained artificially. For dry and compact rocks this will be of vast service. Where the rock is shelly, it may be unnecessary, as the powder may be easily introduced into the natural seams of the mass. A charge of two kegs was thrown into the cavity formed while we were on the ground, and its explosion, though not performed under as favorable circumstances as were desired, caused an extensive rupture of the rock, which is very hard, and was judged to be a satisfactory exhibition of the plan of the inventor. We think the question rests chiefly here: Is it desirable to produce an extensive disruption of rock at a small expense of time, and a reduction of the great labor of drilling a large number of holes for blasting? If so, then we believe Mr. Stickney's plan accomplishes these desiderata; and by burning a hole, which requires one man to blow a bellows, and one to feed the pulverized fuel, which, indeed, may be done by the blower, a cavity can be obtained in a few hours of easy labor by one or two hands, which many, by excessive toil, can scarcely execute in a much longer period. The mechanical force of a large quantity of powder is thus made available at a small cost, while the economy of the plan, we think, must be evident to all interested in mining or quarrying enterprises.

Mr. Stickney's invention, if we are rightly informed, has never been made public, although he has sold the right for several of the Southern and Western States, and England and the Colonies in part. The facts which we witnessed we communicate for the benefit of those whom they may concern. Should this new mode be adopted extensively, (we think it is used at Quincy,) we believe the labor and expense of mining and quarrying will be to a great extent reduced. We shall be glad to have facts on these and similar questions of industrial economy from all sources.

CIRCULATION OF SAP.

A CLERGYMAN of some distinction not long since commenced his Sabbath discourse as follows: "There are some things that I know I know, some things that I think I know, and some things that I know I do not know." We have often thought of this comprehensive sentence when we have read the philosophical explanations of some of our contemporaries, in regard to subjects which we are very much inclined to think might better be classed in the last division of subjects above given, while they speak as if with authority. One of our most judicious writers, who seldom mistakes the imagination for the actual perception, (the learned editor of the *New-England Farmer*,) in a recent number says, "The sap is elevated (in the tree) in the same manner as oil rises in the wick of the lamp." We "do not know" that this is not true, but it seems to us safer and therefore wiser to give only as *hypothesis* what must be acknowledged so very far from absolute demonstration. Perhaps the elaborated sap descends "in the same manner," and perhaps too it does not. There are very serious difficulties attending any theory which has undertaken to provide for the circulation of fluids in vegetables. We have little doubt that it is the same system of influences which causes the entire circulation of vegetable juices, which first sets it in motion at the root. But we should be unwilling to assert any thing on this subject, as a matter of absolute truth, beyond the mere fact that this circulation is actually carried on.

Some recent investigations in Europe have been published, which are of

considerable importance. They refer to the formation and propagation of cells, &c., and to the circulation of the sap. The former are too purely scientific, without much practical importance, to receive very general attention. The theory on the latter branch of the subject approaches the point of actual demonstration. The results arrived at are, that the nitrogenized elements, which are used by the plant, are conveyed upwards from the root exclusively through the woody tissue of trees, while oxygen and carbon are absorbed and given out only by the leaf. As this process is essential to growth, the inference is inevitable that there can be no growth when there are no leaves. Whether this is in accordance with supposed facts, we are not so clear. The descending sap, after its preparation in the leaf, descends only *in the bark*, forming new layers on the outside of the wood already formed. Hence cutting a ring through the bark does not prevent the ascent of sap, nor its elaboration in the leaf, nor its descent until it encounters the ring. Here its progress is stayed. The result is a greater growth above the ring, more wood, and *more fruit*. Hence this may prove of practical benefit to the fruit-grower.

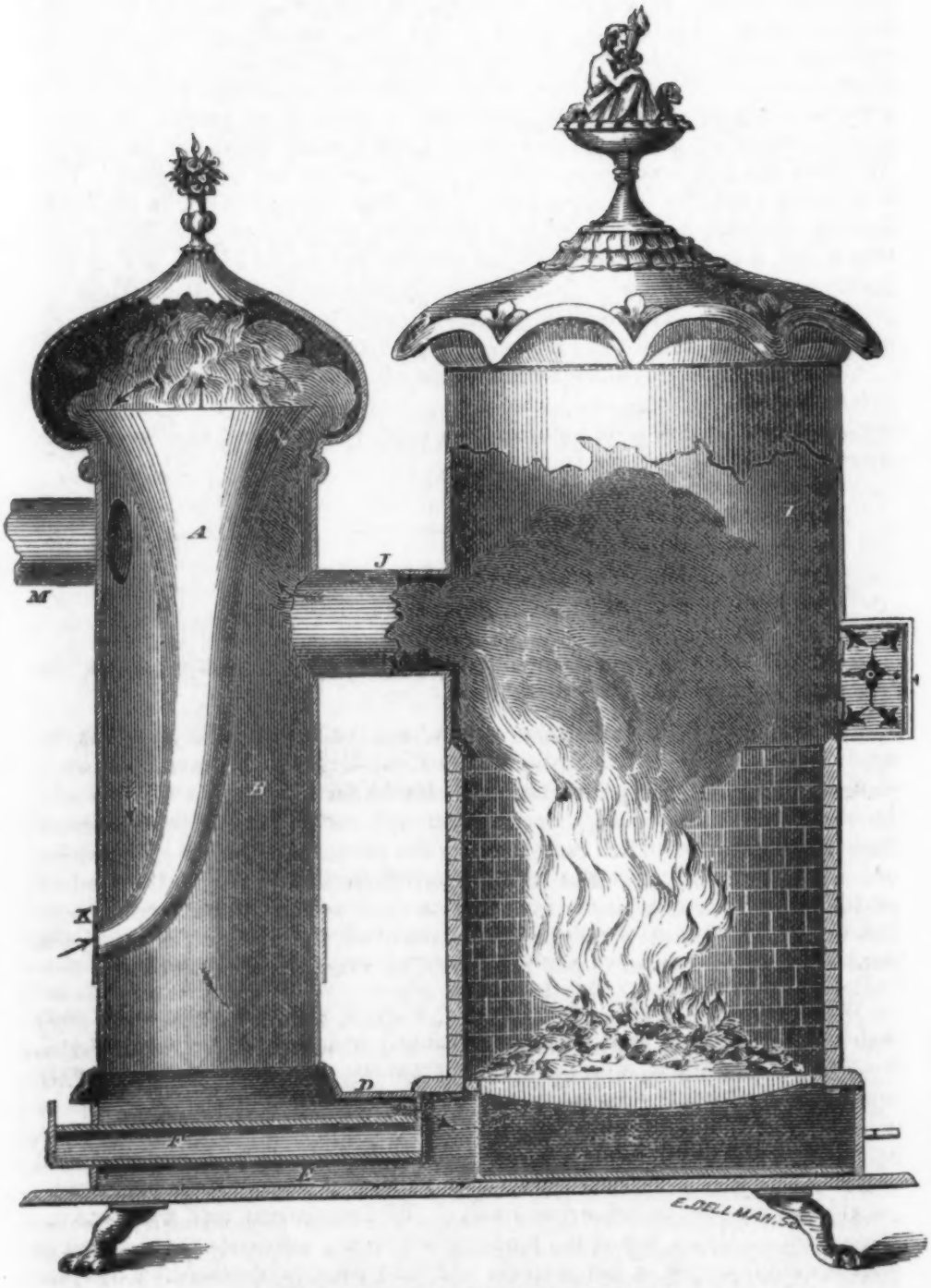
The excess of sap, or that portion which is not used up in new formations, enters the wood through the horizontal organs, and again ascends, thus making a constant circuit, as in animals. We cannot believe that capillary attraction does all this.

FREE TRADE—PROTECTION.

A WRITER in our able contemporary, the *Merchants' Magazine*, utters the following paragraph in the June number:

"The fallacy of the 'protective policy' can be made quite apparent, by applying it to each of the States of our Confederacy. No matter on what pretense it may be, for protection, or it may be for revenue, the effect would be the same. Louisiana produces sugar and cotton, and Maine produces timber and potatoes. Each State needing the products of the other, exchanges are constantly going on. But suppose each State should subject the product of the other State to a large duty before it could sell the goods, and suppose this to be the general arrangement between all the States: the delay, the expense, and the evasion of the law would be vexatious and ruinous."

Well, suppose it would, what then? "Why, it will be equally so between nations." Who denies that duties, injudiciously laid, will be productive of evil, rather than good? If Louisiana really *wants* the potatoes of Maine, it surely would not be wise to demand a high duty on them. But how would it be if she had 10,000 men idle, and 100,000 acres of arable land lying waste, on which potatoes would yield a good crop, after it was properly subdued, and inducements were held out to her own citizens to supply their own State: would *this* produce such horrible results? If Louisiana is, and wishes to be, dependent on Maine, she would properly decline any restrictions to the prompt and bountiful supply of her markets. If she wishes to be *absolutely independent* of them, she must take the opposite course. We can scarcely believe that even the partisan reader of that paragraph would fail to see that the evils resulting from a senseless, heedless, reckless mode of doing a thing would not furnish good reason for refusing to do the same thing in a judicious manner.



ATMOSPHERIC REVERSING-DRAFT FURNACE.

ATMOSPHERIC REVERSING-DRAFT FURNACE,

The opposite engraving represents a very ingenious and valuable improvement in Hot Air Furnaces, owned by William Ennis and R. W. Fenwick, for which a patent was granted to the inventor, Mr. Ennis, of the firm of Keyser & Co., Furnace Manufacturers, this city, (New-York,) on the 29th of March, 1853.

The fire is shown in the furnace I. The grate is supplied with fresh air through a back tube or channel, F, above the ash-pit or pan, E. A pipe or passage, J, connects the fire-chamber or stove, I, with the radiator-chamber, B, in which is placed an inverted hollow cone of cast iron, A, to deflect the fine solid particles of coal that are sometimes carried off from the fire when fresh coals are put on, and also to absorb and retain a great amount of heat, and give it out by radiation so as to economize heat; also to make a portion of air return and feed the fire along with any carbonic oxide that may escape, and thus economize fuel. The pipe F can be closed to regulate the feed of fresh air. The atmosphere is admitted through the hollow cone at K, and passes up as shown by the arrows, then out by the pipe M. The large part of the cone being placed near the pipe J, compresses the smoke into a smaller space before it reaches the top, where it expands and creates a partial vacuum, thus combining the element of an artificial draft without the employment of any mechanical force to do so. This furnace, therefore, must always draw well. If used for burning bituminous coal, from which much volatile matter escapes, the supply of fresh air by the hollow cone, if any flame passes up, will saturate the gas with air, so as to render it combustible, and burn; and thus this stove will be a smoke-consuming one, well adapted for all places where they burn bituminous coal. The arrows show the reversing draft of heated air to support combustion when F is closed.

More information about rights and furnaces may be obtained by letter addressed to William Ennis & R. W. Fenwick, at the furnace manufactory of Messrs. Keyser & Co., 398 Broadway, New-York.

THE GREAT EXHIBITION.

The first pages of this number are devoted to this subject; but since that sheet was put to press, we have been favored with important additional information in reference to this interesting show. We are glad to have it in our power to give these statements to the public, for many have expressed their disappointment at the comparative size of this structure and that in Hyde Park. At the same time, it should be remembered that size is not the true criterion of merit. In taste and elegance, looking either at the proportions of the building or at the minuter details, this is pronounced, by all who have seen both, as by far superior to that. This is said both of the exterior of the building, and of its interior arrangements. When it is well filled with a selection of the goods offered, (for many articles have been rejected for want of room,) we doubt not that the *coup d'œil*, to use a technical phrase, will be quite satisfactory. If deficient in the rich and splendid, compared with the former exhibition, it will no doubt be far superior, even in these respects, to any thing we have ever seen in this country.

But this building is not to contain the whole show. Finding its limits too small for carrying out the objects of the enterprise, and not adapted to the proper display of one of the most important elements of American industry—

to wit, machinery—the Directors of the Association determined to add a building, about 450 feet long, and averaging nearly 30 feet wide, for the purpose of containing machinery on the ground floor, and paintings in the second story. The exhibition will therefore contain a display of machinery in motion hitherto unequalled in this country, and a show of paintings equally without a rival heretofore. This gives about an acre of additional area for the exhibition, making the total nearly five acres.

The day of opening is at hand, and the public are beginning to catch not a little of the spirit which it is so well calculated to inspire.

LOWELL MANUFACTORIES.

On a recent visit to Massachusetts, we spent a day at this centre of American industry, and were allowed by our excellent friend, Mr. Battles, paymaster of the Tremont corporation, to examine the improvements that are just introduced into the mills of that company.

They have erected two turbines, each 12 inches deep, and 100 inches diameter, with which they are to drive the machinery of the whole mill, amounting to 16,600 spindles, with the other machinery connected with the establishment. These wheels operate by means of an immense iron shaft, 450 feet long, weighing at the larger end 180 lbs. to the foot, and tapering to a diameter of six inches.

We were again reminded of the fact, which we had seen stated elsewhere, that the soldiers of Calcutta are clothed in American cottons. We were also furnished with their annual table of the statistics of the manufactures of Lowell for the year 1852, which is condensed as follows:

No. of Manufacturing Corporations,	12
No. of Mills,	51
Amount of Cotton consumed in 1852, bales,	91,650
" Wool " " pounds,	5,148,000
" Iron " " tons,	4,500
" Coal " " tons,	30,575
" Charcoal " " bushels,	68,350
" Wood " " cords,	3,220
" Oil " " gallons,	69,677
" Lard " " gallons,	47,000
" Starch " " pounds,	1,409,000
" Flour " " barrels,	1,565
Total Capital,	$13,000,000
" Spindles,	342,722
" Looms,	10,606
Females employed,	8,470
Males "	4,163
Cloth woven per week—Cotton, yards,	1,460,000
" " Osnaburgs,	90,000
" " Woollens,	27,000
" " Carpets,	25,000
Cotton Dyed and Printed—yards,	705,000
Average wages of Females, clear of board, per week,	$2 00
Average wages of Males, clear of board, per day,	0 80
Medium produce of a Loom, No. 14 Yarn—yards per day,	45

Medium produce of a Loom, No. 30 Yarn—yards per day, 33
Average per Spindle—yards per day, ... $1\frac{1}{4}$

The Middlesex Company make use annually of 6,000,000 Teasels, 2,000,000 lbs. fine Wool, 50,000 lbs. Glue, $30,000 worth Dye Stuffs, and $13,000 worth of Soap.

In addition to the above, the Merrimack Manufacturing Company use 1,000,000 lbs. of Madder, 380,000 lbs. Copperas, 60,000 lbs. Alum, 50,000 lbs. Sumac, 40,000 lbs. Soap, 45,000 lbs. Indigo, per annum.

The Lowell Bleachery use 40,000 lbs. Indigo, and $25,000 worth of other dyeing materials per year.

Other manufactures are produced in the city than those specified above, of a value of $1,500,000, employing a capital of $400,000, and about 1,500 hands.

There are four Banks; the Lowell, capital, $200,000; the Railroad, capital, $600,000; the Appleton, capital, $150,000; the Prescott, capital, $100,000.

The population of Lowell in 1828 was 3,532; in 1840 it was 20,796; in 1850 it was 33,385. Increase in ten years, 12,580.

The Lowell Machine Shop, included among the above mills, can furnish machinery complete for a mill of 6,000 spindles, in three months; and a mill can be built in the same time.

The several manufacturing companies have established an hospital for the convenience and comfort of persons employed by them respectively, when sick, which is under the superintendence of one of the best of surgeons and physicians.

There are two institutions for savings, the Lowell and the City. The Lowell had on deposit the first Saturday in Nov. 1850, from 4,609 depositors, $736,128 12; the City, Jan. 8, 1853, had on deposit, from 2,374 depositors, $192,006 01. The operatives in the mills are the principal depositors in the above banks.

A vast amount of laudable and successful enterprise of a more strictly private character might not be inappropriately alluded to in this sheet, not the least of which are the extensive Powder Mills of Oliver M. Whipple, Esq., and the Paper and Batting Mills of Perez O. Richmond, Esq., both on the Concord river, within the precincts of the city. Messrs. Fiske & Norcross's extensive lumber-yard and saw-mill, on the Merrimack, are also worthy of notice.

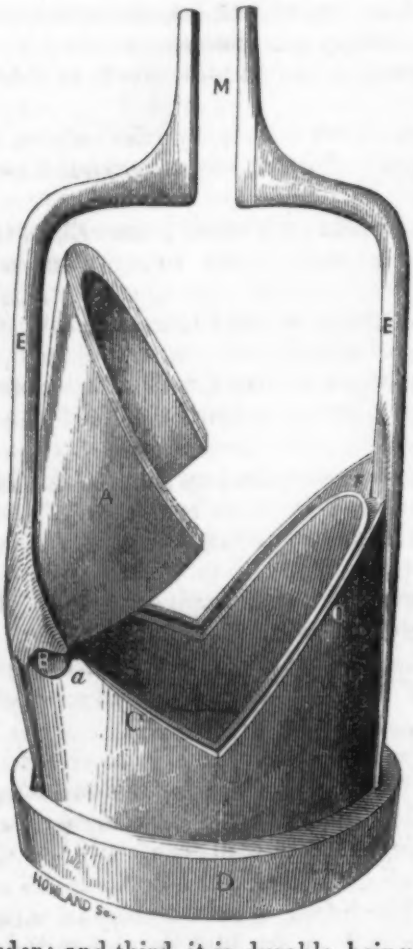
A reservoir of great capacity has been built on the high ground in Belvidere, east of the city, for the purpose of furnishing a ready supply of water to any part of the city, in cases of fire. The water is conveyed into the reservoir by means of force-pumps from the Lowell Machine Shop. Pipes are laid from the reservoir to various parts of the city, at which points hose can be attached to the hydrants without delay, when necessary.

Estimated population of Lowell in 1853, 37,000.

THE POTATO PLANT.—Potatoes are not strictly roots, and the plant is not in that sense a tuberous rooted plant. Its true root is fibrous, and consists solely of those small fibres which are attached to the base of the stem. The potato (the fruit) is not supported directly from the root, but like the balls, or like all other fruits, its nutriment is drawn up chiefly through the root, goes through the stem to the leaves, and thence descends in the bark to the potato. A circuitous route this, surely; but unlike some men, Nature never

does violence to her own laws, even to expedite a good work. The food of the buried potato is prepared by the same process as if it were placed in a more *eminent* position.

IMPROVEMENT IN PUMP VALVES.



Mr. Nehemiah Dodge, of this city, has taken out a patent for a new arched valve which may be applied to various purposes, and which seems to us a very great improvement over those now in use. A representation of this valve, is here given, which may be described as follows: A is the valve, turning upon a hinge at B; *a* is the valve socket, or one of the two plane surfaces upon which it rests when closed; E is the staple which holds the box together; D is the bottom ring on which the outside hydraulic packing rests; F is the space designed for the packing inside when the valve is open: it rests against one side of the staple E, which keeps it in its place. When it is closed, it shuts down upon the two surfaces beneath, which may be packed, if desired, though for ordinary purposes this would be unnecessary. The spear is fastened at M. The valve should be constructed of a thin piece of metal.

The peculiar excellences of this valve consist, first, in giving a large passage through it when it is open. This passage is not more limited at the valve than on the lower parts of the piston. Second. it is simple, and not liable to get out of order; and third, it is durable, being made of materials that will not wear out in many years.

It may be applied to various purposes, being useful not only for common water pumps, but equally applicable to steam engines. It may be fitted into small metallic tubes as readily as into larger bores.

NEW ROTARY ENGINE.

By the invitation of the inventor, Capt. Barrows, we were of the small company on board the little steamer *Rotary* on the 19th ult., in a trip of twelve or fourteen miles, designed to exhibit her capabilities. The readers of the *Farmer and Mechanic* will remember an engraving with a description of this new engine, under date of Oct. 23, 1852. We can now give only a general account of its arrangements. The power is applied directly to the shaft of the wheels, or, more accurately, to the steam-wheel, the axis of which is the shaft of the paddle-wheels. The machinery is thus brought into a very

small compass. The steam passes from the boiler into the top of the cylinder which encloses the steam-wheel. Four sliding pistons project beyond the circumference of the wheel, and fill the vacant space between it and the cylinder. The power of the steam acts directly upon one of these pistons, driving it forward and causing the wheel to revolve. By a very simple cam-arrangement, the moment the next piston comes under the power of the steam, the first piston slides in towards the centre, opening a passage for the steam behind it to escape, so as to prevent all resistance to the power acting upon the second piston. This process is repeated as either piston is brought in contact with the steam. This action is also "double," the steam being admitted on each side of the cylinder at the same time, so that the power is applied to each half of the wheel. An escape-valve is also provided on opposite sides of the cylinder, near the entering valves. We need not here refer to the details of the engine, any further than to say, that the anti-friction rollers, the stuffing-boxes, packing-pieces, &c., by which a very perfect action is secured, are of the simplest form, and of thorough workmanship. Information on these subjects can be obtained of the inventor, at the corner of Beekman and Water streets. We regard this as a quite successful experiment. An engine is here presented to the public, at a much less cost than those of the usual form, occupying but a small part of the space they require, the power of which is apparently capable of being increased indefinitely. The boat "Rotary" is about 36 tons burden. The machinery, except the boiler, scarcely occupies a cubic yard. The paddle-wheels are 8 or 9 feet in diameter; the paddles, ten in number, are each ten inches wide and three feet four inches long. Two are immersed at one time. The wheels revolve, under a pressure of 80 lbs., which her certificate allows her, about forty-two times per minute, and give her a speed of quite ten miles an hour, in still water.

ATMOSPHERIC TELEGRAPH.

THIS seems to be the next step in the order of progress, and one which presents fewer apparent difficulties than most of the great mechanical inventions of the day led us to anticipate when they were first proposed.

This plan contemplates the sending of packages, mail bags, &c., in all their huge bulk, through a given distance at a very rapid rate, and yet a rate which may be substantially under the control of the operator. Suppose a tube were extended from New-York to Boston, having a diameter of two feet. The plug or plunger or piston is at the Boston end, and pumps are set in motion on this side. The pressure of the atmosphere becomes constantly diminished on the inner surface, while on the outer it remains the same. As soon as the difference of these pressures equals, or rather exceeds by a small amount the resistance of friction within the tube, the plunger will be set in motion, and the amount of motion will depend upon the extent to which the pumps are operated. Were the plunger forcibly detained till the exhaustion was pretty thorough, when set at liberty its velocity would be very great, and perhaps in practice it might be found that, to overcome certain obstacles, in passing curves, or from other causes, a considerable velocity would be necessary to prevent its progress from being entirely checked. The more rapidly the exhaustion is carried on, the more speedily, of course, would the object be attained; and the only practical difficulty which seems to us to present itself, is the possibility that the friction of the plunger, increased by the weight to be carried, would be too great for the pressure of the atmosphere on the tube.

This friction of the plunger must be something essential, to insure it from admitting the air between its own surface and that of the tube. And if this pressure is equivalent to a force of many pounds, it may exceed the efficient pressure of the atmosphere on the outer surface, which must be less than fifteen pounds to the square inch. This would be the greatest possible working power, were the vacuum behind it perfect. If the air is only partially exhausted, the working pressure will, of course, be much less. Probably this difficulty may be overcome, if found to exist, by applying forcing pumps behind the plunger. If this were done, we can see no reason to doubt that almost any weight could be driven through a pipe free from short curves or other prominent obstructions. We shall be glad to see this project commenced and carried through forthwith.

RAILROAD OPERATIONS.

PORTLAND AND MONTREAL RAILROAD.—The grading of this road beyond Island Pond, and the junction with the Canadian terminus, is completed, and the placing of the rails has been commenced. This section extends about thirteen miles.

ALBANY AND BINGHATON RAILROAD.—The contracts have been let, on the condition that it shall be completed in the fall of 1855.

READING RAILROAD.—This company are about commencing four new stone bridges, in the place of wooden ones. One is to be at Peacock's Locks, over the Schuylkill; one at Orwigsburg Landing; one at Black Rock, and one at the Falls of Schuylkill. The last will consist of six oblique arches, each of seventy-eight feet span, with an elevation of roadway forty-eight feet above the water. They are also adding ten new locomotives of the first class.

CLEVELAND, MEDINA, AND TUSCARORA RAILROAD.—The route of this road is laid down as follows: the Cleveland, Cincinnati, and Columbus Railroad is used to Grafton, twenty-five miles; thence to Medina and to Dalton, through Seville, and through Dover to New-Philadelphia. From thence to the Ohio, opposite Wheeling. Its length is 418 miles.

ATTICA AND ALLEGHANY VALLEY RAILROAD.—Ten miles of this road are graded and nearly ready for the rails. This road connects with the New-York Central line at Batavia, and runs to the south line of the State, there connecting with the Alleghany Valley Railroad to extend from Pittsburgh to the northern line of Pennsylvania, connecting these sections of country with the far West.

THE ST. LAWRENCE AND ATLANTIC RAILROAD COMPANY has declared a dividend of 27¾ per cent. This includes all the back interest from the commencement of the work, and is a final settlement of the road stock previous to the amalgamation with the Grand Trunk Company. It is supposed that the cars will run regularly from Portland to Montreal by the middle of July next.

KENNEBEC AND SOMERSET RAILROAD.—The stock of this railroad is taken up. It extends from Augusta to Skowhegan, through Vassalborough and Waterville.

NASHUA AND LOWELL RAILROAD.—The income for the year ending March 31, 1853, was $142,129 26; expenditures, $86,108 05; earnings, $56,021 21. Two dividends of 4 per cent. have been declared, and there is a nett surplus on hand of $8,021 21.

VERMONT AND MASSACHUSETTS RAILROAD.—Earnings for the year ending April, 1852, were $15,442 18; for that ending April, 1853, $22,577.

BOSTON, CONCORD, AND MONTREAL RAILROAD has commenced running to Woodville, opposite Wells river, and the event was celebrated by a great gathering, with a dinner, speeches, toasts, &c.

GIRARD RAILWAY.—This road, as surveyed, will be about 225 miles in length, from Girard, Alabama, to Mobile. This city, Mobile, has subscribed $1,000,000 towards its construction to Greenville.

MARIETTA AND CINCINNATI RAILWAY.—This Company have advertised for contracts.

RAILROAD IN CALIFORNIA.—It is proposed to build a railroad from Benicia to Marysville, a distance, as surveyed, of about eighty-five miles. The report of the surveyor is favorable.

OHIO AND PENNSYLVANIA RAILROAD.—An indignation meeting has been held at Massillon, on account of alleged mismanagement of this road. Sundry resolutions were adopted.

DUBUQUE AND PACIFIC RAILROAD COMPANY.—A Company has been organized for the construction of this road, with a capital of $11,000,000.

RAILROADS IN VIRGINIA.—Completed roads measure 600 miles, and 610 more are now in progress.

NORTH CAROLINA has completed 280 miles, and proposes some 500 more.

OHIO has 1,285 miles completed, and 1,719 in process of construction, besides others advertised for contract.

THE PACIFIC RAILWAY COMPANY has completed a road for fifty miles west of St. Louis, and it is under contract for 135 miles. Its length is to be 600 miles to the boundary of the State. The point where the road intersects the Kansas river, is the point from which Mr. Edward Beale is to take his departure on the survey of the Benton and Fremont route for a railroad to the Pacific.

PHILADELPHIA, EASTON, AND WATER-GAP RAILROAD.—Twenty-two sections were allotted to contractors on the 28th ult. The Company expect to finish the road through to the Lehigh river next year.

THE ALBANY AND SUSQUEHANNA RAILROAD is said to be contracted for by Governeur Morris, George L. Schuyler, Sidney G. Miller, Jonah W. Baker, James S. T. Stranahan, and C. G. Case.

NEW-YORK AND NEW-HAVEN RAILWAY.—Receipts for the year amount to $806,713 19, and the expenses, $380,052 32—leaving a profit balance of $359,490 31.

The whole cost of the New-York road and equipments is $4,318,606 60, exclusive of real estate and buildings, amounting to over half a million. The capital stock is $3,000,000, and the bonds of the Harlem road and Canal lease, $1,840,000.

The whole number of passengers carried over the road the past year is 956,753—as follows:

Between New-Haven and New-York,	614,715
Commuters,	130,115
Between New-York and Naugatuck road,	21,789
Between New-Haven and Junction of Naugatuck,	39,517

Between New-York and Bridgeport, - - - - - -	19,725
Through passengers between Hartford, New-York, and New-Haven,	48,603
Between New-York and Boston both ways, - - - - -	42,167
From Canal Railroad, both ways, - - - - - -	4,407
To and from Hartford, - - - - - - - - -	112,513

There has been a large outlay in capital for the completion of the second track, a most important and necessary work, which will enhance the receipts of the Company, and immeasurably increase the protection of travellers.

THE first passenger train from Syracuse to Rochester, by the direct route, passed over the road on the 11th ult.

ON the 17th ult., direct railroad communication, it was expected, would be open from Columbus to Macon, Ga., by the completion of a branch uniting the South-western and Muscogee roads.

THE vote in Milwaukie on the loan of the city credit to the amount of two hundred thousand dollars to the Lake Shore Railroad, was 1,566 in favor, to 409 against the measure.

ARRANGEMENTS have been made between the Danvers and Georgetown and Newburyport Railroads, which will secure a route from Haverhill and Newburyport through the centre of Essex county to Boston, by these railroads, in connection with the Boston and Maine Railroad.

It is reported that the Boston and Maine Railroad have taken a lease of the Danvers Railroad for one hundred years, guaranteeing five per cent. on the cost, with all that it may earn above that amount.

These roads, when completed, will open a new avenue of travel between Salem and Haverhill, and also between Salem and Danvers and Boston, via the Salem and Lowell, Danvers, and Boston and Maine Railroads.

WISCONSIN has given charters for fifteen thousand miles of railroad, that will require $300,000,000 to construct.

CANADIAN RAILWAYS.—Arrangements have been made for an immediate survey of the route from Port Whitby to Lake Huron.

The contract for this road has been taken by Messrs. Mallish, Morrill, and Russell, of Brantford, for about $600,000, the work to be finished in two years.

The Town Council of Brockville has before it a by-law to enable the municipality to take £50,000 in the railroad from Brockville.

The City Council of Toronto has refused to sell the £100,000 stock held by the city in the Toronto and Guelph Railway, at par, by a vote of 13 to 10.

It is expected that the Great Western road will be completed to Port Sarnia by the first of July, 1854.

ST. LAWRENCE AND CHAMPLAIN RAILROAD.—Receipts for the year were $140,000, being $36,000 more than the receipts of 1851.

MENDENHALL'S HAND-LOOM.—We copy from the *Pittsburgh Post* the following notice of S. C. Mendenhall's hand-loom:—

"Another most beautiful and truly valuable new invention that I examined with some care, is a hand-loom which has very lately been patented by S. C. Mendenhall, of Richmond, Indiana. This loom is constructed, as are almost all other really meritorious inventions, in the most simple manner. It

is light, and very neat in its appearance; and may be easily worked by a child of ten years old. It is worked without cams or gear-wheels: the ells are raised and the shuttle thrown at each movement of the beam; and in less than five minutes a change can be made on the same warp from a twill to plain goods—from satinet to flannel, or from either of these to any other goods that are woven on a common loom. This invention is peculiarly adapted to the newer settlements of our country, where manufactories have not been started; and if extensively introduced, may retard the advance of manufacturing establishments, (which I should look upon as a great blessing,) because of the cheapness of the machine, the ease with which it may be worked, and the increased amount of cloth that may be made in a given time: for I am told that on this loom one man may weave thirty yards a day of any common cloth."

"FEEDING BEES" AGAIN.

Our neighbor of the *Scientific American*, in his journal of the 18th, copies our notice of his statement, that a pound of sugar will make two pounds of honey, as follows:—

"Our neighbor must revise *his* chemistry. How can a stalk of corn produce more weight of fruit than the guano applied to manure it? The question is not how much honey is produced from a pound of food, but a pound of sugar. Does not honey contain more moisture than sugar? Let our neighbor put 20 pounds of honey in a sugar evaporating-pan, and expel all the moisture, and then weigh the product, and see if he gets any more than 10 pounds of a gummy sugar."

While we admit that we know very little about the transformation of food into secretion, or of the manner in which plants grow, we suppose there is an important difference, well established. The stalk of corn is not made from the substance of the guano, wholly or chiefly. Nearly 98 per cent. of all plants is from something else than the soil, or the manure applied to it. This is established by numerous careful experiments. But with the conversion of food into animal secretions, the fact is perhaps equally well established, that the secretion is invariably less than the quantity of food. In other words, there is always more or less of excrement, while the quantity of secretion is not materially increased by the appropriation of free gaseous matter. An animal probably never increases in weight to the whole amount of his food, nor does, probably, the amount of his food fall essentially below the sum of his secretions and excrements. In the case of bees, they are known to void a considerable amount of excrement (which comes originally from the food) when at work, though very little while idle, and their food goes to sustain their bodies in a healthy condition, and to form the peculiar secretion honey, and also wax. In the animal, the food is the entire material, perhaps, with the exception of oxygen; while in plants, the soil seems to be chiefly a medium for conveying nourishment to the plant. Without intending to assert expressly the truth of either of the two theories on this subject, we suppose it is and must be admitted, that if the soil gives up a portion of its own substance to the plant, it gives up far less than the plant receives, a great portion of it being conveyed through the soil as a medium, from the atmosphere.

We do not doubt, by the way, that our neighbor possesses a thorough knowledge of chemistry, but should rather have said that he misapplied his knowledge. Nor is he alone in the same misapplication, in reference to this

article of honey. Apiarists of years' experience have asserted the same doctrine. Our statement was made on the strength of actual experiments, a given quantity of food being given and eaten, when they had no access to other food. This seems the surest mode of testing the truth on this subject.

NEW-YORK HORTICULTURAL SOCIETY'S EXHIBITION.

We paid a visit to this annual show, held at Metroplitan Hall, June 14, 15, and 16, and found, as usual, quite a collection of plants, most of them in flower. We failed, however, to see many individual plants that were especially worthy of notice, further than for their comparative merit, as intimated in the list of premiums. Fuchsias seem to be the flower of the season, almost as many pots of this being exhibited as of all other kinds. Mr. Cope's splendid *Victoria regia* again made its appearance from Philadelphia. One of the finest things in the show was a cut specimen or two of the *Magnolia mycrophylla*, from a tree of Dr. Kearns, Hudson street. The flowers are very fine. The usual varieties of hot-house plants were exhibited by the well-known florists of the city and neighborhood. There was a good show of cut flowers, by Isaac Buchanan; of the Cactus tribe, &c., by Thomas Hogg & Son, and various plants by J. B. Lenoir, Alfred Bridgeman, Andrew Reid, and others. Mr. Dunlap's fine sago plant, *Cycas revoluta*, was there, and some excellent lemon trees, with the banana plant, from Shepherd Knapp, Esq., and others of less imposing appearance. The *Cupressus funebris*, by Thomas Hogg & Son, is a beautiful plant.

The following is the award of premiums, so far as we are informed.

Ericas.—First premium, L. Menard, Albany.

Geraniums.—First premium for six Pelargoniums to George Hamblin, gardener to W. C. Langley, Brooklyn; 2d premium, three Scarlet Geraniums, to Wm. Vandermenter, Astoria. Mr. Chorlton, of Staten Island, showed some fine specimens.

Fuchsias.—First premium to John Humphrey, gardener to F. Howe, Esq., Brooklyn; 2d premium to Mr. J. H. Prentice. Discretionary premium to George Hamblin, gardener to Mr. Langley, of Brooklyn.—very fine plants.

Hot-house Plants.—There was quite an extensive show of these, though limited in varieties. First premium to James Weir, Yellow Hoop, L. I.; 2d premium to M. Colman, gardener to Mr. Cummin, of Williamsburg.

Orchis.—First premium to L. Menard.

Cactus.—A discretionary premium to Luke Mullen.

Carnations.—First premium to Wm. Chorlton, gardener to J. C. Greene, Esq., Staten Island.

Fruits.—In this department we noticed good specimens of strawberries and cherries, but no grapes, gooseberries, &c. The 1st premium for *cherries* was given to Joseph Cudlepp, Jr; *strawberries*, 1st premium to Isaac Buchanan, Astoria; 2d, to Isaac C. Winans; 1st premium for three quarts do. to J. Hardman, gardener to W. H. Paine; good specimens were also shown by Wm. Smith, West Farms.

Vegetables.—This part of the show was good, but limited.

Cauliflowers, 1st premium to Martin Collophy, gardener to J. H. Prentice; 2d do. to A. Gordon, gardener to E. Hoyte, Astoria.

Rhubarb, 1st premium to A. Gordon; 2d do. to John Brill.

Potatoes, 1st premium to James Angus, gardener to W. W. Fox, West Farms; 2d do. to J. Hardman.

Peas, 1st premium to James Angus; 2d to J. Hardman.
Beets, 1st premium to Joseph Cudlepp, Jr.; 2d do. to John Brill.
Cabbage, 1st premium to Joseph Cudlepp, Jr.; 2d do. to John Brill.
Radishes, 1st premium to James Angus.
Cucumbers, 1st premium to A. Gordon, gardener.
Lettuce, 1st premium to John Brill; 2d do. to Joseph Cudlepp, Jr.
Best Vegetables, 1st premium to John Flick, Bloomingdale.

LAYING OUT SURFACES.

A FEW simple rules are oftentimes convenient to thoso who are not conversant with surveying operations, and a writer in the *Western Horticultural Review* has communicated to that work some very good ones, some of which we copy, and to which we add a few others.

To lay out an acre in a circle.—First fix a centre, and with a rope as a radius, seven rods, three links and three eighths long, one end attached to the centre, and kept uniformly stretched, the sweep of it at the other end will lay out the acre.

For one quarter of an acre, a rope three rods and fourteen links will be the right length.

For one eighth of an acre, a rope two rods and thirteen links will be the right length.

Triangles.—If you wish a triangle to contain just an acre, make each side nineteen rods, five and a half links long.

A triangle whose sides are six rods and twenty links long each, will contain one eighth of an acre.

To lay out an ellipse or oval.—Set three stakes in a triangular position. Around these stretch a rope. Take away the stake at the apex of the triangle, which will be where the side of the oval is to come; move the stake along against the rope, keeping it tight, and it will trace out the oval.

A square to contain an acre, or just one hundred and sixty rods, should have each of its sides just twelve rods, ten feet and seven tenths long.

To draw an oval of a given size.—The long and short diameter being given—say twenty feet for the shorter, and one hundred for the longer—divide the short diameter into any number of equal parts—say ten—and from each point draw a line parallel to the long diameter; then divide the long diameter into the same number of equal parts, (ten,) and from each point draw a line parallel to the short diameter. Then draw a line from point to point where each corresponding line cuts the other, on the outside, and this connecting mark will describe the oval or ellipse required.

NEW STAPLES FROM AFRICA.

A LONDON correspondent has recently sent to the *North American* a letter on this subject which is worthy of attention. It appears that a new trade is now opened with that continent, which contains 160,000,000 of inhabitants. One of the articles recently received in England is a fibrous substance, sent by a missionary from Abbeokuta, as *red cotton.* It is not cotton, but a new species of silk. It is brought from the Houssa country, in great quantities, and is supposed to have been colored with *alkanet root.* Another article,

sent also as cotton, is a peculiar description of wool, from Gratta, on the west coast of Abbeokuta. It is tolerably fine, of a buff color, worth about one shilling and three pence a pound, and proves very acceptable to wool-dealers. It may be had in large quantities.

The finest merino textures, like those used in the manufacture of the finest shawls by the Persians and others, are also grown in Africa. The sugar-cane is beginning to receive attention, and finds there a congenial soil and climate. Rice is also grown. Grapes and oranges are found every where "in wild luxuriance," and are found to pay the gatherer very liberally. That continent must eventually prove of great value to our commerce.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CANADA THISTLES.

July and August are the months to exterminate Canada Thistles. Some people doubt whether they can be killed even by perseverance; but I am no doubter on this point. Thistles can be eradicated, and with much less difficulty than quack-grass. The best way to get rid of them is to mow them when they have attained to their full size. Any man who has had experience in mowing and killing them, can judge as to the time when they should be cut down. The stalks are hollow; the blossoms are red—not much faded; the lower leaves are dead; and the weather warm and dry. When these appearances present themselves, you should make an attack upon your beds of thistles. Several years since, we had a large and thrifty "patch" of them, on rich soil, and the land was seeded down to timothy, though, in consequence of the luxuriant growth of the thistles, the grass did not amount to much; and the whole mass of stuff was mowed down in the month of July, and not one bit of it removed from the field. The second year after they were thus mowed, they were scarce, a few only remaining in the field. The lot has been mowed every year since, and to my certain knowledge there is scarcely a thistle to be found in the field. Another "patch" was served the same way, and the lot is now clear of thistles. Ploughing them out by the roots is adopted to some extent in this section of New-York; but, on the whole, mowing them down in the months of July and August seems to be the best mode of extirpating them. I do not look upon them with one-half as much horror, either in the meadow or corn-field, as I do upon quack-grass. This is decidedly a bad grass, and will soon take advantage of a large field.

I am of opinion that Canada thistles can be killed by deep and thorough ploughing. For instance, if you have a piece of land which you wish to summer-fallow, and which has been and is burdened with thistles, you would doubtless make money by ploughing it at least three times, and not let your plough run less than *ten* inches deep. I think this mode of managing them would result in their final extermination. When they are mowed down close to the ground, the remaining portion of the stalk is usually filled with water; and this leads to the decay of the roots, and the death of the thistle.

In Central New-York we are troubled a good deal with thistles, though we are gradually getting rid of them, and ultimately shall free ourselves entirely from them; or, at least, I think such will be the case if we adopt the system of mowing them in hot weather, and at the right stage of their growth.

W. Tappan.

Baldwinsville, N. Y, June, 1853.

SERPENTINE.—We are surprised that no more account is made of this rock for ornamental purposes. Much of it is as elegant as any *verd antique*, and localities of it are not very unfrequent. We have personally visited some half dozen of them, and are persuaded that the supply is abundant. It is of various colors; and while some of it is of a uniform green, other specimens are as handsomely variegated as any of the mottled marbles.

For fire frames and ornamental hearths, it is said to be superior to marble. There is an extensive supply of serpentine in Cavendish, Vermont, which for a time was operated; and though the mill where the rock was sawed is still standing, and scores, if not hundreds of slabs are lying about the building, many of them handsomely polished, nothing has been done with it for years. Again, in Orange county, in the same State, immense masses of this rock are found all along the Green Mountain range. It again crops out in Orange county, in and around Troy, in connection with the iron ore.

In Newbury, Massachusetts, there is a bed of it, which, however, is probably less extensive than in the other places named; but from personal observation, we have no doubt that all the other localities might be turned to good account. All are in the vicinity of a railroad, (that at Troy being most remote,) and in places quite accessible. We have seen elegant fireplaces from Cavendish locality, that would compare well even with the choicer kinds of Italian marble.

TABLE FOR PLANTING CORN, TREES, &c.

THE following table may be useful for pointing out the number of hills of potatoes, corn, plants, trees, &c., required for an acre of land, when planted at any of the distances given:—

Distances apart.	No. of Plants.
½ ft. by ½ ft.	174,240
1 " 1 "	43,560
1½ " 1½ "	19,360
2 " 1 "	21,780
2 " 2 "	10,890
2½ " 2½ "	6,969
3 " 1 "	14,520
3 " 2 "	7,260
3 " 3 "	4,840
3½ " 3½ "	3,555
4 " 1 "	10,890
4 " 2 "	5,445
4 " 3 "	3,630
4 " 4 "	2,722
5 " 1 "	8,712
5 " 2 "	4,356
5 " 3 "	2,904
5 " 4 "	2,178
5 " 5 "	1,742
6 " 6 "	1,210
7 " 7 "	888
8 " 8 "	680
9 " 9 "	531
10 " 10 "	435

SCIENTIFIC AND MECHANICAL MONTHLY RECORD.

THE GAUGE QUESTION.—Edward H. Brodhead, civil engineer, has a long article in the *Milwaukie News* on the subject of the gauge of railways. In the course of it he says:

"I passed over portions of the New-York and Erie Railroad last season, on foot, for the purpose of examining the effect produced on the rails, and especially on the curved portions, by the passage of the trains. I knew theoretically that the pressure against the outer rail was much increased by an increase of the width between them, and also, that it might be lessened by elevating the outside rails, though this would only be true for a given rate of speed. Still I was surprised to find that the flanges of the wheels acted, to a greater extent than I had before seen on the narrow gauge, as a plane to shave off the inside of the top of the outside rail, in consequence of the increased resistance by reason of the extra width, and found that a shaving of iron was left in the track for nearly the entire length of the curve after the passage of trains.

"Now, it requires some considerable power, with a sharp-edged tool in a planing machine, to cut off a shaving of the same size. How much power, then, must have been exerted to produce a like result by pressing the smooth surface of the flanges of the wheels against an equally smooth surface of the rail?"

TO KEEP FELLOES TIGHT.—Soak each felloe before the tire is put on, for one hour, in hot linseed oil. This will essentially prevent it from absorbing water, and thus it prevents decay. We get this from a writer in the *Southern Planter*.

NEW COTTON MATTRESS.—A patent has been secured for a new mattress of cotton, so prepared that it will not mat, but retain its elasticity as well as hair. If the plan succeeds, it will be of value in two ways: one in giving a good bed at a cheap rate; the other, in opening a new and general market for one of our chief staples.

REFINING SUGAR.—John McIntosh, of Surry, England, has patented a new process for refining sugar. The improvement consists in placing evaporating pans, used in the concentration of saccharine fluids, in rooms, the air of which is heated to such a temperature as will evaporate the fluid. A current of air is made to circulate through the room, so as to carry off the vapors as the saccharine fluids are raised by endless bands passing over and under rollers, in and above the pans, to expose an extended surface to the action of the heated air.

INDIA RUBBER AND COAL TAR.—Mr. C. Goodyear, of this city, has recently taken out a patent in England for a new compound, composed of India rubber and coal tar vulcanized with sulphur. Coal is heated in an open boiler until it requires the consistency of melted rosin, when it is mixed with India rubber, in proportions which may vary according to the character of the material to be produced for a specific purpose. It is mixed with sulphur, and then heated to vulcanize it.

INDIA RUBBER TEETH.—This article, in the form of purified white India rubber, has been patented in England for making artificial teeth, gums, and palates. By its adoption, many advantages, hitherto impossible to be attained, have been introduced. The adhesion is complete; it can be moulded with perfection to suit every inequality of the gums and teeth, and supplies an artificial periosteum, as it were, to the teeth, which often become painful by the wasting away of the gum. Added to these, is the elasticity of the material, which completely obviates the inconveniences that arise from any motion with artificial teeth as made by other means. Combs are also manufactured from the same material.

WONDERFUL PEGGING MACHINE.—It is said that a machine has been invented that will peg a shoe in two or three minutes, with one, two, or three rows of pegs, and *make its own pegs* as it does the work. The *Buffalo Express* stands godfather to this statement.

NEW SCREW-CUTTER.—Mr. D. M. Robertson, of Piermont, N. Y., foreman in the machine-shop of the Erie Railroad, has lately invented and constructed a machine for cutting screws on iron bolts, which has two peculiarities: one is, that the driving-power is applied to a pulley, giving the pulley and the cutting-die one uniform rotary motion, and thus avoiding the reverse motion of the common machines, and thus saving at least one third of the power and time of bolt-cutting. Another advantage is, that the cutting edge of the cutting die is perpendicular to and parallel with the centre of the bolt when fitted to its place to be cut. The machine promises to be of much utility. Patent pending.

CAST IRON WELDING.—In the foundry connected with the railroad repair-shop at Piermont, N. Y., Harvey Rice, Esq., Superintendent, the experiment has been successfully tried of casting fused iron upon unmelted iron. A flange had been broken from the out surface of a locomotive cylinder. Mr. R. E. Falkenberry, foreman of casting, so adjusted the moulding-sand to the broken flange and to the cylinder, and so applied the fused iron as to restore the part wanting. The minutiæ of the process he will explain to those who inquire. The new part added to the flange is so skilfully welded on, that the precise line where the new and old parts unite cannot be detected after the parts are polished. Broken bills have been mended in this same manner, at these works.

USE OF COKE ON RAILROADS.—The *Cumberland Alleghanian* says that the passenger engines on the Baltimore and Ohio Railroad, west of Piedmont, are now using coke as a fuel, instead of wood, and that it meets the most sanguine anticipations of the Company, as to economy and efficiency. The coke was furnished from the mines of the Swanton Coal and Iron Company. The introduction of coke instead of wood on all the roads on the Atlantic seaboard must now soon follow; thus opening a new and immense market for the products of our mines. It is doubtful if any other section of the United States than our own Alleghany region can furnish a suitable coal for the purpose of making coke for locomotives.

COLORED PHOTOGRAPHS.—A new process of coloring photographs has been patented by J. Leon Jardieu, of Paris. It is applicable to pictures taken on paper rendered transparent, or on glass, and consists in applying oil or other colors at the back of the picture, so as to give the requisite tints to the several parts of the photograph, without interfering with the extreme delicacy of effect which characterizes this class of productions. Application has been made for a patent in this country.

STREET-CLEANING MACHINES.—A man named Nurton Ramkin, of St. Louis, has invented a machine for cleaning streets, which is thus spoken of by the *Republican:*

"It is a scraper so peculiarly constructed, that as it passes over the street it throws the earth on the street up in rows, at the curb-stones, much as a plough will throw the sod over in a particular direction. When the earth and cleanings of the street are thus deposited, another machine throws the whole into heaps convenient to be carted away. It is said by mechanics and others who have examined the model, that with two horses and two men, the labor of fifty men can be performed in less time."

IMPROVEMENT IN JOINING STONES.—An improved method of uniting or locking stones together in building light-houses, and for other like purposes, by which the necessity of using mortar is entirely superseded, has been invented by John P. Avery, of Stonington, Connecticut, who has taken measures to secure a patent. It consists in dovetailing together the sides of the stones used for the foundation, and joining them again in a similar manner with others, so that it is impossible to separate them without first breaking the stones in pieces. In order to unite them more firmly, a bolt or key is employed for pressing the dovetails firmly in their corresponding slots; or pieces of stone or other material may be employed for this purpose, and the crevices filled up with mortar.

STRAW PAPER.—This manufacture was first introduced about fifty years ago, but was only partially successful. By an interesting and important improve-

ment in the mode of preparation, the use of straw as a material for paper may now be considered permanently established in England, Ireland, and the United States. So little difference is perceptible between rag and straw paper, that the latter is used by one of the London journals regularly. One peculiar feature of the manufacture is, that although the article can be produced at a price not exceeding that of ordinary printing paper, it is applicable for both writing and printing purposes.

Novel Mode of Bridging.—The method adopted for bridging the Great Pee-dee river, on the Wilmington and Manchester Railroad, is worthy of remark, as showing another purpose to which iron may be extensively applied. The piers for the bridge are composed of large hollow cylinders of cast iron, nineteen feet in circumference: their bases are sunk many feet into the bed of the river by exhausting the air from within them, by the method know as the Pneumatic Process, for forming foundations. The cylinders are filled with concrete, and thus form hills of great strength and permanency.

Horse-Power.—On the trial of the Broadway Railroad question, it was testified by James Lorey, civil engineer, that the power of a horse is about sufficient to draw twenty tons on a level railroad. The weight of 60 men, at 140 lbs. each, would be about four and a half tons, and car and passengers, ten and one fifth tons. "Two horses cannot be depended on to draw this weight up a grade of 110 feet to the mile. It would be equal to 64 tons on a level. A horse could draw four times as much on a level, in a car on a railway, as in an omnibus over a cobble-stone pavement."

Curious Device in Grafting.—The gardeners of Italy sell plants of jasmins, roses, honeysuckles, &c., all growing together from a stock of orange, myrtle, or pomegranate, on which they say they are grafted. But this is a mere deception; the fact being, that the stock has its centre bored out, so as to be made into a hollow cylinder, through which the stems of jasmines and other flexible plants are easily made to pass, their roots intermingling with those of the stock. After growing for a time, the increase in the diameter of the stems, thus enclosed, forces them together, and they assume all the appearance of being united to one common stem.

Compressed Air Carriage.—The *Paris Presse* says that it has seen, upon the Champs Elysées, a carriage containing two persons, proceed for twenty minutes, at the full speed of a horse, by means of a cylinder of compressed air, of so small a volume that you might put it in your pocket. The inventor thinks he has obtained a practicable plan of utilizing compressed air, and has discovered a means of compressing it at a merely nominal cost. A paper on this subject has been read to the Academy of Sciences. M. Julienne proposes to adapt the principle to carriages and street vehicles merely, to which it may be applied with great economy and perfect safety. With a small cylinder, a party may take an airing at the Bois de Boulogne, at any rate of speed, from a walk up to a gallop.

Important Invention.—At a late sitting of the Austrian Academy of Sciences at Vienna, Herr Von Amer read a paper upon a newly discovered process of printing from all sorts of objects with comparatively plain surfaces. Among the articles mentioned which have been copied by the new process, are plants, some of them in flower, embroidery, etched agate, insects, fish-scales, &c. The speaker calls this "Natursolbetdruck"—printing from Nature—and said that this discovery forms a new era in the pictorial illustration of works on science and art. The objects copied were given with singular fidelity to the originals. No hint was given as to the process.

Improved Lithographic Press.—An improved press for lithographic printing has been invented by H. C. Spaulding, of Hartford, Connecticut. The object accomplished by the improvement consists in giving a uniform and forcible impression to all parts of the stone, with the expenditure of but a very small amount of power. The arrangement of Mr. Spaulding for effecting this object is this: a wood or metallic air-tight chamber or tube, containing water or other fluid, with its bottom or one side composed of India rubber or some other water-proof,

elastic or pliable material, is used to give the impression; said chamber being furnished with a tub and plunger, and the pliable bottom or side of the chamber serving as the tympan. By applying pressure to the plunger, an equal amount of pressure is transmitted by the water or fluid to every part of the tympan, and by using a small plunger an immense pressure may be obtained with a small expenditure of power. Measures have been taken to secure a patent.

Glazed Ware—American Porcelain.—*Glaze*, with which our "china ware" is covered, is variously prepared. Gypsum, silica, and a little porcelain clay are ground together, and mingled with water. Into this mixture each article is dipped, and immediately withdrawn, when the glaze is left evenly spread over its surface. It is then dried, and exposed afterwards for several hours to a powerful heat.

The glazing for common earthenware is a mixture of the oxides of lead and of tin.

The glazing of "stone ware" is made by volatilizing common salt in a heated furnace, which combines with the silex of the ware. The substance of "stoneware," is a kind of porcelain clay, containing an oxide of iron and of lime. The Editor of the *Tribune* says:

"The custom-house valuation of china, porcelain, earthen and stoneware, imported into this country in the year ending June 30, 1846, was $2,261,331; in 1850, $2,601,363; in 1851, $2,320,002. The sum actually paid for these articles during the last year by our jobbers was probably not less than five millions, and by the consumer at least eight millions of dollars. And there is not a particle of reason for our importing these wares from the Old World, outside of the fact that Europe had the start of us with regard to them, and has so far managed to keep it. We have every natural requisite to their cheap and elegant production, as we trust will soon be made evident. Old dealers have assured us that while almost every ware or fabric extensively produced in this country has been steadily and materially cheapened, the wares we are contemplating now sell at very nearly the prices of thirty years ago.

Opalescent Paper.—How can we make one kind of paint or liquid produce many different colors; and this with an amount of material almost beneath the power of man to weigh or measure? Mr. De la Rue has solved this question by the production of his beautiful iridescent and opalescent paper. Water is poured into a flat vessel; and when quite tranquil, a very minute quantity of spirit varnish is sprinkled upon the surface; this, by a species of attraction between the two liquids, spreads out on all sides, and covers the whole surface with a film of exquisite thinness.

A sheet of paper, or card board, or any other article, is then dipped fairly into the water, and raised gently, with that surface uppermost which is to receive the color; it lifts up the film of varnish from off the surface of the water, and the film becomes deposited upon the paper itself. The paper is held in an inclined position, to allow the water to drain off from beneath the film; and the varnish then remains permanent on the surface of the paper.

The paper thus coated with colorless varnish exhibits the prismatic tints with exquisite clearness. The film of varnish is so extremely thin, so far beneath any thing that could be laid on with a brush or pencil, that it reflects light on the same principle as the soap-bubble, exhibiting differences of color on account of minute differences in the thickness of the film at different parts. And not only so, but the self-same spot exhibits different tints acording to the angle at which we view it. It is a means of producing a beautiful result with a marvellously small expenditure of materials.

Hemp.—The New-Orleans papers speak highly of specimens of hemp made from the fibres of the okra, or "gumbo" plant. They state that the merit of this hemp consists in the cheapness of its culture, the abundance of the raw material, the quickness with which it grows—giving, they understand, three crops a year—its superior yield to the acre—five times as much as the Kentucky hemp—its more durable qualities in water or damp than any other hemp, and its easy manufacture into bagging. It is stated that the article can be produced at the North as well as at the South, though not so profusely, and that it will supersede all other sorts of hemp in the manufacture of bagging.

GREAT IMPROVEMENT IN THE TREATMENT OF FLAX.—A great improvement in the early preparation of flax has been discovered in Ireland by a Mr. Watt. By it the flax is prepared for scutching without fermentation in 24 hours. The coarse flax is steamed along with some lime-water, or high-pressure steam itself will answer, for five hours in a close, tight vessel: it is then taken out, run between heavy fluted rollers, and dried, when it is fit for scutching. By this process the woody matter is rendered easy of separation from the fibrous; in scutching, very little tow is made. It is a plan highly spoken of by the Royal Flax Society.

PLASTIC MATERIALS FOR FORMING VARIOUS OBJECTS.—Five parts of sifted whiting are mixed with a solution of one part of glue. When the whiting is worked up into a paste with the glue, a proportionate quantity of Venetian turpentine is added to it, by which the brittleness of the paste is destroyed. In order to prevent its clinging to the hands while the Venetian turpentine is being worked into the paste, a small quantity of linseed oil is added from time to time. The mass may also be colored by kneading in any color that may be desired. It may be pressed into shapes, and used for the production of bas-reliefs and other figures, such as animals, &c. It may also be worked by hand into models, during which operation the hands must be rubbed with linseed oil; the mass must also be kept warm during the process. When it cools and dries, which takes place in a few hours, it becomes hard, and may then be employed for the multiplication of these forms.

This is no doubt practicable, and we give it as one mode, but probably gutta percha is now the cheapest and best material for all such uses. We purpose to prepare a paper on this *material* in our next number.

SHIP VENTILATION.—A new mode of accomplishing this important service has been devised and put in practice in a new Liverpool ship. The masts are hollow, and are furnished with valves to open or shut at pleasure. Those who have noticed the effect of a tall chimney-glass or a common solar lamp, will appreciate the efficiency of this plan. An argand burner at the bottom of such a tube would greatly add to its efficiency.

THE following analysis of wheat bran, made by Professor Norton, of Yale College, shows that it contains ingredients valuable for feeding. The Nos. indicate different qualities of wheat and bran:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Oil, - - -	5.16	6.17	6.16	6.53	6.49
Water, - -	11.29	11.82	12.02	12.06	12.91
Ash, - - -	6.90	6.09	9.09	7.08	6.07

IRON RAILROAD BRIDGE.—A bridge of this kind is nearly completed, over the Monongahela, above Fairmount, Va. It is second only to that over the Menai Straits, in England, having no rival on this continent.

THE CLIPPER-SHIP "Northern Light" has made the most successful voyage from California that has been made by any vessel, including the steamships. Her time was only 76 days. She was built by Messrs. Briggs, South Boston.

ANOTHER YACHT VICTORY.—The American yacht "Truant," the property of Mr. Robert Grinnell, has recently beaten all her competitors at a regatta on the Thames. She was built in this city by Mr. Robert Fish.

NEW USE FOR MUSTACHES.—The stone-masons of Glasgow are cultivating these appendages of the face, to screen the mouth from the fine sand to which they are exposed in their trade. If found useful, we submit and might recommend them to some other tradesmen, but the evidence ought to be conclusive ere such a custom is regarded with much favor.

IMPORTANT "STRIKE."—The wood-choppers, we learn, are determined on a strike. Some demand more *wedges*, and threaten to *split* unless acceded to. After some time of *log-rolling* and *barking* on both sides, this *knotty* question was settled by their demands being granted.

EDITORS' JOTTINGS, ETC.

STEAMBOATS FROM NEW-YORK TO BOSTON.—The author of *An Englishman's Experience in America* came from Boston to this city in the *Empire State*, one of the boats of the FALL RIVER route. He uses, in this work, the following well-deserved commendation:

"The word *boat* gives a very imperfect idea of this floating palace, which accommodates, at the very moderate charge of four dollars each, from five to six hundred American citizens and others, of all classes, in a style of splendor that Cleopatra herself might envy. Her barge with suits of purple silk, in which she received Marc Antony, was nothing to it. There is little to remind one of machinery, for the paddle-wheels are covered, and the engine is rendered invisible by being surrounded with glass and drapery. However, one thing is certain: the vessel moves smoothly and quickly through the water. I followed a crowd of five hundred up a handsome staircase, through splendidly furnished saloons, covered with carpets of velvet pile, to the upper deck. . . . . Tea being announced, we all adjourned to the gentlemen's cabin. . . . . There were three tables the entire length of the room, covered with every thing that was beautiful, but nothing that seemed eatable except pineapples and some small, delicate, delicious-looking things, that, for want of a better word, I shall call rolls, though it vulgarizes them sadly. Notwithstanding this unusual appearance, you no sooner wished for any thing than a ministering spirit was at your elbow to gratify you. At his touch, pineapples became butter, pyramids tea-cakes, and magical boxes savory pies. Tongue, ham, and all kinds of delicacies issued from their flowery retreats at his bidding. At the end of the banquet, you heard whispered in your ear, "half a dollar." It was produced and silently disappeared; not a chink was heard.

HARLEM RAILROAD.—This road has a shop for repairs of cars and locomotives. Mr. Sloat, Superintendent of road; John Leach, Superintendent of repairs. This road has 132 miles of track, and sends out daily three through trains; nineteen trains to William's Bridge, three to Croton Falls, and fifteen shorter trains. Two daily through freight trains are sent out, and fifteen Sunday trains go out and return; one going as far as White Plains: 2,000 miles are run daily, and 37 locomotives and 350 horses are used on short routes.

The Company's machine-shop has five lathes, and other tools in proportion. It is soon to be further enlarged. The carpenter-shop, on Forty-second street, has, on an average, sixty hands.

NEW-YORK AND NEW-HAVEN RAILROAD.—G. W. Whistler, Superintendent of road; G. B. Simonds, Superintendent of motive-power. This road has seventy-nine miles of single, and seventy miles of double track. The canal road has thirty-eight miles of track, and eighteen miles of branch track, connected with the New-York and New-Haven Road.

The machine-shop has five lathes, two drills, and other tools. The carpenter-shop has fifty hands, and the blacksmith-shop, eight fires.

They send out seven trains to New-York and back daily, two each way to Port Chester, two each way to Bridgeport, and two daily freight trains. Twelve through express cars from Boston to New-York have just been added; twelve more for this road only are soon to be added. The largest locomotive has 16 by 22-inch cylinder, and weighs 26 tons. The driving-wheels are 6 feet in diameter.

HARTFORD AND NEW-HAVEN RAILROAD—From New-Haven, Connecticut, to Springfield, Massachusetts. E. M. Reed, Superintendent of locomotion; M. L. Sikes, Superintendent of road. This road has sixty-two miles of track, and in six months will have sixty-two miles of double track. It has sixteen locomotives, the largest of which has 16 by 20-inch cylinder, and weighs 25 tons. It runs six daily trains to Springfield, four to New-Haven, and two through freight trains daily.

The machine-shop has seven lathes, two planers, and other tools in proportion.

The carpenter-shop employs eighteen hands, and the blacksmith-shop has seven fires. The repairs are all done in Hartford.

New-Haven and New-London Railroad.—Repair-shop in New-Haven. R. M. Dowd, Superintendent of road; Henry A. Lincoln, Superintendent of repairs. This road has fifty miles of track, six locomotives, and runs two passenger and one freight through trains daily. The machine-shop has two lathes and other tools in proportion. All the buildings and shops are new, and are continually enlarging.

Camden and Amboy Railroad.—On this road, which connects New-York with Philadelphia, we noticed a new, but very good arrangement for the comfort of invalid passengers. This is a medicine-chest put up in the Ladies' Car. We were assured by the conductor that it was often found of great service to children and others. The road, under the successful agency of Captain Bliss, of New-York, and Wm. H. Gatzmer, Esq., of Philadelphia, is one of the best paying roads in the country.

Latting Observatory.—The most attractive building in the vicinity of the Crystal Palace is the Latting Observatory, now in course of completion. It is situated on the highest part of the island, in full view of all the surrounding country, and will reach the height of 350 feet. The structure is of an octagon form, with a base of seventy-five feet in diameter, and will accommodate 2,000 people at one time on its various landings. It is of timber, well braced with iron, and anchored at each of the eight angles with about forty tons of stone and timber. At distances of 100, 200, and 300 feet, passengers will be lifted by a steam car to landings.

At the highest point will be placed a telescope of great power, which will be the largest in the country, with a 16-inch glass, or a glass one inch larger than the Cambridge telescope. The glass is now manufacturing in Europe, and until it is completed, a 10-inch glass will be used. The instrument will cost about $24,000. At the lower landings, the vision will be aided by achromatic telescopes, with 4-inch openings. From the second landing, the ascent, to those who do not choose to avail themselves of the steam car, will be by means of a spiral stairway. The Observatory will cost about $75,000.

A Simple Fire Annihilator.—A paragraph is going the rounds urging the use of burning sulphur in extinguishing a burning building. A package of two or three pounds of sulphur thrown into the kindling fire before the air rushes into the building, is said to be very efficient in extinguishing the flames. This is no doubt true. But we fear that the application of this extinguisher would not always prove, in the event, unlike the man who burnt the wasps' nests that were in his barn. The barn was consumed with the wasps. The gases so plentifully evolved by burning sulphur are very destructive to life. They cannot be breathed with impunity, and hence the use of this material might prevent the trial of other means of very great importance. Water could only be thrown upon it from a distance. When fires are in the hold of a ship or between decks, or in other conditions where human life is not put in jeopardy, these means would no doubt prove very efficient.

Artesian Well at St. Louis.—One of these deep borings was commenced in St. Louis in 1849, by Mr. Wm. H. Belcher, which has now attained the depth of 1,590 feet. It is bored or drilled by a "sinker" which is 34 feet in length, 2¼ inches in diameter, and between 700 and 800 lbs. in weight. It is attached to poles, each of which is about 30 feet long, which are screwed together as they are required. The whole is moved by a "doctor," worked by the boilers used for the refinery engines. The object of Mr. Belcher is to obtain pure water, limestone water only being found near the surface. At the present depth, a stream of water, strongly impregnated with sulphur, issues from the well. The different strata which have been pierced are as follows:

1st, Limestone, 28 feet; 2d, shale, 2 feet; 3d, limestone, 231 feet; 4th, cherty rock, 15 feet; 5th, limestone, 74; 6th, shale, 30; 7th, limestone, 128½; 8th, shale, 1½; 9th, limestone, 38½; 10th, sandy shale, 6½; 11th, limestone, 128½; 12th, red marl, 15; 13th, shale, 30; 14th, red marl, 50; 15th, shale, 30; 16th,

limestone, 119; 17th, shale, 66; 18th, bituminous marl, 15; 19th, shale, 80; 20th, limestone, 134; 21st, cherty rock, 62; 22d, limestone, 138; 23d, shale, 70; 24th, limestone, 20; 25th, shale, 56; 26th, limestone, 34; 27th, white soft sandstone, 15 feet.

The first appearance of gas was at the depth of 466 feet. It was strongly impregnated with carbonated hydrogen. At 520 feet the water became salty; 200 feet lower, the water contained 1⅞ per cent. of salt, which afterwards, at near 1,200 feet, increased to 3 per cent. The level of the sea is reckoned about 532 feet below the surface of the city.

Crime in London.—A recent official report gives an abstract of returns of the children below the apparent age of fourteen, found by the police as mendicants and thieves, as follows: Without parents, 94; having parents who appear to be in a condition of life to maintain and educate them, 231; having parents capable of contributing to their maintenance and education, 580; whose parents send them to beg and live in idleness and profligacy on their earnings, 411; total number of children at large, 1316. The total number of children in common lodging-houses is 1782, distributed respectively under the foregoing heads in the following numbers: 54,—105,—1190,—433, making a total of 1782. This number, added to the former, 1316, gives a total of juvenile mendicants and thieves amounting to 3098. The number of children at large, and living in idleness without education, and apparently neglected by their parents, of the lower classes, who are generally in the receipt of wages, amount, as nearly as can be ascertained, to 20,641 *under* 15 *years of age*, and there are 911 who have been charged with other offenses than as mendicants and thieves.

The Village of Cohoes, N. Y., on the lower Falls of the Mohawk, contains two axe factories, making about 2,200 axes and tools every day; four large cotton mills, employing about twelve hundred operatives; three extensive knitting mills, giving employment to about six hundred hands; one linen thread factory on a very extensive scale; one mill for making carpet and other yarns, manufacturing 1,000 lbs. of wool per day; one bobbin and spool factory; one large mill for sawing veneering; one extensive bedstead factory; one mill for manufacturing omnibus wheels; two machine-shops; one furnace; one marble-yard and works; one flouring-mill. The population of the place is estimated at one thousand, and the capital invested at two millions of dollars and over.

Destroying Wasps.—A method of destroying wasps is recommended by a correspondent of the *Revue Horticole*. It consists in mixing up plaster and emptying it while liquid into the nest. This plaster introduces itself perfectly into the cracks. It forms a mass and envelops all the wasps, so that their larva, eggs and all, are destroyed. It should be practised at the close of the night, so that all may have returned into the common abode.

Another equally efficacious plan to destroy wasps which have taken up their quarters in mud walls, is to make a sort of glue by boiling old hides, and mixing this with soot. Several coats of this mixture were applied over the surface of the wall with a hair broom. The wasps, closed up by the coats of glue in their nests, perish by hunger.

A Gigantic Steamship.—The following are said to be the dimensions of an iron steamer about to be built by Mr. Scott Russell, of London, for the Eastern Steam Navigation Company. She is to be 620 feet long, 100 feet beam, 6,000 horse-power, and 12,000 tons burden. She is to be propelled by four paddles, and a screw. The horse-power will be proportioned as follows; 2,000 for the screw, 2,000 for the midship paddle-wheels, and 2,000 for the fore paddle-wheels.

Horse Statistics.—The New-York *Herald* has an elaborate article in relation to the horses kept in this city. The number is stated to be 22,540, and their value, $2,495,000. The number of persons directly dependent on the labor of horses for subsistence is 12,710. The annual value of the labor of the horses is put down at $4,443,860. The construction of railroads through the principal thoroughfares of the city, on which are used cars drawn by horses, will probably lessen the number employed in omnibuses. The Sixth Avenue railroad, which has been in operation about seven months, employs 236 horses.

List of Patents Issued from May 24 to June 21.

Duncan E. McDougall, of Troy, N. Y., for Improvement in Door Fasteners.

Philip H. Keck, of Morgantown, Va., for Improvements in Cultivators.

R. H. Middleton, of Alexandria, Va., for Improvement in Compound Rails.

Charles Neer, of Troy, N. Y., for Improvement in Fire Places and Stoves.

Marie Louise Roucout, of Paris, France, for Improvement in Grate Bars. Patented in France, Sept. 10, 1851.

Arnold Buffum, (assignor to J. D. Lynde,) of New-York City, for Improvement in Gold Washer and Amalgamator.

William H. Jenison, assignor to Charles Millington, now deceased, and John Jordan, assignor to James M. Parker, all of New-York City, for Improvement in Compositions for a Filter.

Henry Baker, Catskill, N. Y., for Converting Rotary into Reciprocating Motion.

T. A. Dugdale, Richmond, Ill., for Improvement in Washing Machines.

Henry W. Hewett, New-York, for Improvement in Propellers.

William S. Hubbell and Amos Barnett, Kingsville, Ohio, for Improvement in Compositions for Treating Wool.

S. P. Kittle, Buffalo, N. Y., for Improvement in Door Fasteners.

R. W. Betson, Philadelphia, Pa., for Improvement in Boilers for Cooking Stoves.

Oliver Ellsworth, Hartford, Ct., for Improvement in Knob Bolts.

R. J. Falconer, Washington, D. C., for Improvement in Hose Coupling.

P. G. Gardiner, New-York, for Improvement in Quartz Pulverizer and Gold Amalgamator.

Herman Goldsmith, jr., New-York, for Improvement in Water Closets.

Leon Jaresson, Jersey City, N. J., for Improvement in Painting on Cloth.

Gerard Sickles, Brooklyn, N. Y., for Improvement in Platform for Ferry Bridges.

George W. Wright, New-York, for Improvement in Screw Presses for Packing Boxes.

Ebenezer Talbot, Windsor, Ct., for Improvement in Boring Rock.

Julius Hornig and Ludwig Suess, Union Hill, N. J., for Improvement in Artificial Stone.

H. L. Smith, Cleveland, Ohio, (assignor to H. L. Smith, of Cleveland, and Levi Battles and H. A. Swift, of Ravens, Ohio,) for a Paper File.

L. P. & W. F. Dodge, Newburg, N. Y., for Improvement in Pumps.

Charles B. Fitch, of Galena, Ill., for Improvement in Mode of Cutting Tenons.

William G. Huyett, of Williamsburg, Pa., for Improvement in Harvesters of Grain and Grass.

Sherman S. Jewett and Francis H. Root, of Buffalo, N. Y., for Improvement in Stoves.

Harvey Murch, of Lebanon, N. H., for Improvement in Mop Heads.

George F. Muntz, Jr., of Birmingham, England, for Improvement in the Manufacture of Metal Tubes.

Lea Persey, of Patterson, Pa., for Improvement in Self-waiting Dining Tables.

Fergus Purden, of Baltimore, Md., for Improvement in Mortising Machines.

Alexander A. Sampson, of New-Orleans, La., for Improvement in Brick Machines.

E. H. Smith, of New-York, N. Y., for Improvement in Copying Presses.

John H. Sturgis, of New-York, N. Y., for Improvement in Type-casting Machines.

Giles F. Filley, of St. Louis, Mo., for Improvement in Cooking Stoves.

James M. Brookfield and Ephraim V. White, of Honesdale, Pa., (and Jacob Faatz, having been decided to be a joint inventor with said White) the said Faatz and White, assignors to Andrew K. Hay and James M. Brookfield, for Improvement in Manufacturing Glass.

John L. Kingsley, of New-York, N. Y., for Improvement in Moulding Gutta Percha Stereotype Plates.

John J. Greenough, of Boston, Mass., for Improvement in Manufacture of Plate Glass.

Horatio Allen and D. G. Wells, of New-York, N. Y., for Improvement in Cut-Off for Steam Engines.

Benjamin E. Colley, of Cambridge, Mass., for Improvement in Piano-Fortes.

William H. Danforth, of Salem, Mass., for Improvement in Power Printing Presses.

Jno. A. Elder, of Westbrook, Maine, for Improvement in Jacquard Apparatus of Looms.

Edmund L. Freeman, of Ann Arbor, Mich., for Improvement in Bog-Cutting Cultivators.

Frederic W. Howe, of Windsor, Vt., for Improvement in Machines for Planing Metal.

William S. Hyde, of Townsend, Ohio, for Improvement in Cultivator Ploughs.

Simon Ingersoll, of New-York, N. Y., for Improvement in Feed Motion in Plug-Cutting Machines.

Jno. H. Manny, of Waddam's Grove, Ill., for Improvement in Cutters to Harvesters.

David A. B. Newcomb, of Conewango, N. Y., for Improvement in Hill-side Ploughs.

Augustus R. Pope, of Somerville, Mass., for Improvement in Electro-Magnetic Alarms.

George Rohr, of Charlestown, Va., for Improvement in Seed Planters.

I. R. Shank, of Buffalo, Va., for Improvement in Lath Machines.

Walter Sherrod, of Providence, R. I., for Improvement in Expanding Mandrels for Turning Machinery.

William McK. Thornton, of Bloomsburgh, Pa., for Improvement in Horse Collars.

Jos. H. Tuttle, of Seneca, N. Y., for Improvement in Saws.

Jonas B. Wilder, of Belfast, Maine, for Improvement in Hill-side Ploughs.

Benjamin R. Norton, of Syracuse, N. Y., for Improvement in Metallic Pointed Pens.

William F. Tyson, of Orwigsburgh, Pa., for Improvement in Propellers for Canal Navigation.

Enoch Hidden, of New-York, N. Y., for Improvement in Side Lights for Ships.

R. L. Hawes, of Worcester, Mass., for Improvements in Envelop-Folding Machines.

WATER WHEELS.

The Subscribers offer for sale "Jagger's Improved French Turbine Water Wheel," which they believe to be unrivalled. Circulars and Tables relating to the same may be obtained at this office, or will be forwarded to any one desiring them.

Nov. 13-tf. JAGGER, TREADWELL & PERRY, No. 110 Beaver street, Albany, N. Y.

MC'CORMICK'S REAPING & MOWING MACHINE FOR 1853.

This celebrated Machine has been greatly improved for the coming harvest, and is warranted superior to any Reaping and Mowing Machines now before the public. Having an IRON Beam, in mowing, the grass passes over freely, already spread; and in Reaping, the grain is LEFT AT THE SIDE of the Machine in sheaves ready for binding. This Machine will cut two acres of grain, or 1½ acres of grass per hour, with two horses. For Sale in every State in the Union, and by

RICHARD T. ELKINTON, 53 South Wharves, Phila.

May, 53.—2t1983.

FOR SALE,

IMPROVED SHORT-HORN & ALDERNEY CATTLE,

of different ages; the greater part of them bred on the farm of Thomas P. Remington, Esq. Many of the Short Horns are descendants of the herd of the late Mr. Bates, of Kirkleamington, England, justly celebrated as one of the best and most scientific breeders of the age. The Alderneys have been bred directly from the best imported Stock. The Cows are unrivalled as rich Milchers. Apply to

AARON CLEMENT, Agent

for the purchase and sale of improved Stock, &c.,

Sept. tf. **Cedar Street, above Ninth Street, Philadelphia.**

FARMERS' BOILERS, OR LAUNDRY KETTLES,

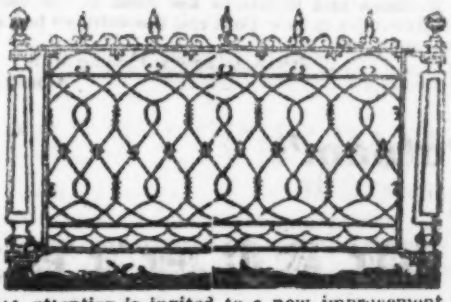
OF ALL SIZES, FOR SALE BY

BARTLETT, BENT & SON,

No. 238 WATER STREET, New-York.

Mar. 1y.*

NEW-YORK WIRE RAILING WORKS.



SPECIAL attention is invited to a new improvement in the manufacture of *Wire Iron Railing and Grating*, for all purposes where wood, cast or wrought iron are used, at half the cost; to wit,—for Cemeteries, public and private grounds farms, balconies, verandahs, alcoves, &c., from 50 cts. to $2 per lineal foot.

Portable and *permanent* Wire Fence for railroads, farms, parks, lawns, &c., manufactured on an entirely new plan, from 9 to 18 cts. per foot, 4½ feet high, with Iron Posts.

The *Portable Iron Bedstead*, exceedingly ornamental, is so constructed as to fold up into a convenient form for transportation, and only requires to be seen to be adopted.

N. B.—All kinds of Wrought or Cast Iron Buildings made to order, and Designs and Circulars procured by addressing the manufacturer and proprietor,

JOHN S. WICKERSHAM,
240 Broadway.

Warerooms of the New-York Patent Machine Shop.

Works 59 and 61 Lewis street.

Agents, C. B. C. & Co., 215 Pearl street.

Medals have been awarded for the above, both by the American Institute of N. Y., and by the Franklin Institute of Philadelphia.

Mar. 13-1y.

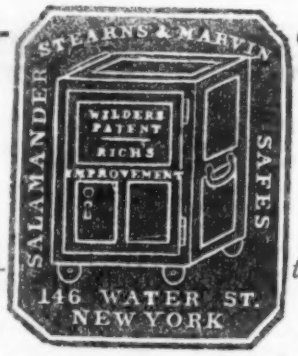
WILDER'S PATENT SALAMANDERS,

WITH RICH'S IMPROVEMENT.

The only Safes with Wilder's Patent & Rich's Patent

COMBINED, ARE MADE BY

146 Water St.,



STEARNS & MARVIN,

New-York.

The sole Proprietors of Rich's Patent with Wilder's Patent, and joint Proprietors of Wild-er's Patent with Silas C. Herring.

THE GREAT FIRE IN CHILLICOTHE, ONE THIRD THE TOWN BURNT TO ASHES!

CHILLICOTHE, OHIO, Tuesday, April 13th, 1852.

MESSRS. STEARNS & MARVIN—Gentlemen: Yours of the 5th is at hand. In reply, every Safe in the fire, except yours, has proved good for nothing. I lost a large Safe—it was perfectly destroyed; but in the small Salamander I bought from you, nothing was injured.

Your obedient Servant, W. T. CLEMSON.

The above letter shows that in a real hot fire RICH'S SALAMANDERS are the only Safes to be depended upon. In the Pearl street fire, eleven Safes, of different makers, were totally destroyed, Rich's Safe alone bidding defiance to the flames, preserving notes, bonds, and mortgages, to the value of $100,000. The Chillicothe fire is a parallel case—every Safe but Rich's is destroyed. These repeated occurrences prove incontestibly that Wilder's Patent Salamander, with Rich's improvement, are the best Safes made in the United States, or in the whole world. They can be had at the depot, No. 146 Water Street, and at the Factory, corner of St. Mark's Place and Avenue A, New-York. STEARNS & MARVIN.

ALSO AT THE FOLLOWING AGENCIES:

Isaac Bridge, New Orleans, La.; L. M. Hatch, Charleston, S. C.; Thompson & Oudesluys, Balt., Md.; Holyoake, Lowns & Co., Memphis, Tenn.; Eddy & Morley, Toledo, O.; Allis & Howes, Evansville, Ind.; S. Shephard & Co., Buffalo, N. Y.; Walter K. Marvin, Lockport, N. Y.; Barney Brothers, Mobile, Ala.; Chas. H. Campfield, Savannah, Ga.; Hall and Moses, Columbus, Ga.; DeRosset & Brown, Wilmington, N. C; W. Randall, St. Paul, M. T.; Morly & Raynolds, Cleveland, O.; Alfred Wright, Roch., N. Y.; J. Hutton, Montreal, Ca.; Starr & Mason, Camden, N. J.; J. H. Westcott, Plattsburgh, N. Y.; Ashley Brothers, Ogdensburgh, N. Y.; A. B. Merrian, Oswego, N. Y. Dana & Co., Utica, N. Y.; Norton, Bradley, Co., Syracuse, N. Y. 1 yr.* Jy.'52

1852-56.

WOODWORTH'S Patent Planing, Tonguing, Grooving, and Rabeting Machine.

RECENT Decisions and Jury trials having fully and finally established all the claims of the Woodworth Patent, the subscriber is now prepared to furnish the most perfect planing machines ever constructed, and to license parties to use them in the counties of Allegany, Broome, Cattaraugus, Chenango, Columbia, Duchess, Fulton, Madison, Montgomery, Otsego, Putnam, Queens, Rockland, Suffolk, Tioga, Tompkins, Ulster, Washington, Westchester, Wyoming, Yates, and the other *unoccupied towns and counties in the State of New-York; and in the northern half of the State of Pennsylvania*, in the counties of Bradford, Crawford, Clinton, Elk, Lawrence, Lycoming, Luzerne, Mercer, M'Kean, Pike, Potter, Susquehanna, Tioga, Wayne, Warren, and Wyoming.

THIS JUSTLY CELEBRATED MACHINE was patented December 27, 1828, and the patent having been extended to the 27th day of December, 1856, it has now FIVE YEAR'S UNEXPIRED TERM. This machine, at one operation, reduces to a thickness, and planes, tongues, grooves, beads, and rabets in the best manner, 3,000 FEET OF BOARDS OR PLANK IN AN HOUR; and is also extensively used for planing, sticking, &c., door, sash, and blind stuff, and for sticking mouldings. All kinds of planing are performed by it in a better manner, and more expeditiously and cheaply, than it can be done by any other machine. The price of a complete machine is from $150 to $760, according to size and capacity. From 4 to 10 horse-power will drive the machine, and it will run for years without repairs.

Nine tenths of all the planed lumber used in our large cities and towns is now dressed with Woodworth's Machines. These manufactured by the subscriber may be seen in constant operation in the Steam Planing Mills at Albany, Astoria, Canistea, Dunkirk, Elmira, Flushing, Gibson, Jamestown, Leroy, Lockport, Newburg, Olenn, Stapleton, Syracuse, Warrensburg, &c.

For Machines and Rights to use them in the unoccupied towns and counties in New-York and the northern half of Pennsylvania, apply to

JOHN GIBSON, Planing Mills,
Albany, N. Y.

Apr. 17–tf.

George W. Putnam's

PATENT

SAW-FILING MACHINE.

THE Subscriber [sole proprietor of the above Patent] keeps Machines constantly on hand at Glenn's Falls, Warren Co., N. Y. Will ship to order, to any part of the United States. Putnam's Machine, attended by one man, will file more saws in a given time than three men by hand in the old way, and do the work much better, at a great saving of files and saws. Lumbermen will find it to their interest to have one of these machines upon their mills. Terms for a single Machine, with right of use, Seventy-five Dollars. ALBERT H. SWEENEY.

July 17, 1852.

NEW IMPROVEMENT
IN
PLANING MACHINES.

HAVING received letters patent for my New Improved Planing Machine for planing boards and planks, I now offer for sale Machines and Rights for States, Counties, or Cities. My Improved Machine is unlike all others in its operation, and it will produce more work and of better quality than any others now in use. The principles of its operation are simple, as there are no gear or belts in or about the machine, these being all placed beneath the floor. The amount of work done is only limited by the number of persons feeding the machine. A matching apparatus works in connection with this machine, by which the Boards are planed and matched in the same operation. The planing and matching are superior to that produced by the hand plane; and both sides of the board are planed at the same time if desired.

One of these machines will be in full operation at the Machine Shop and Foundry of Messrs. F. & T. Townsend in this city by the 1st of June next, where it can be seen.

GEORGE W. BEARDSLEE,
Residence 764 Broadway, Albany.

June 5th.

A. HALL'S
Fire-Brick Works,
PERTH AMBOY, N. J.

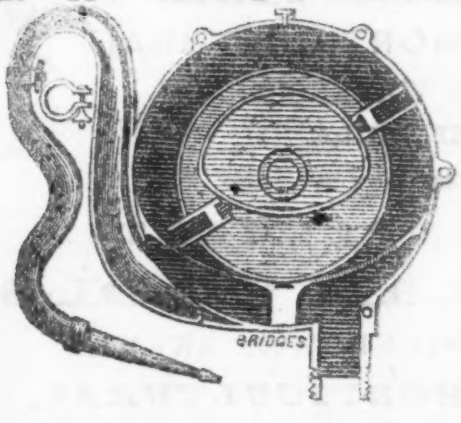
THE stock of the best No. 1 Fire Brick constantly on hand. Vessels of any draft can load at any stage of the tide and season of the year.

SHAPES.—Large and small Bull-Heads, in walls, from 5 feet to 1 foot circle; Wedges, Split Brick, Soaps, Cupola, for any circle from 18 inches to 30 inches, constantly on hand.

KAOLIN of the best quality.

ONE MILLION Bricks can be made at this factory in six months, and none are made from October to April. All orders for unusual shapes should be given in the Spring, as bricks are *better* and made much *cheaper* in the *summer months*. Vessels loaded with dispatch. Orders promptly executed. Mar. 3, 1852.

A. W. CARY'S ROTARY FIRE-ENGINE PUMPS.



THE Inventor, after thoroughly testing this engine pump, for the past two years,) feels confident that it is not equalled any thing now in market, in the way of raising or forcing water: the motion being rotary, the stream is constant, without the aid of an AIR vessel. The packing is self-adjusting, very durable, and cannot well get out of order.

These pumps are well calculated for all the purposes for which pumps or hydrants may be used, viz.. Factories, Steamboats, Tanneries, Breweries, Distilleries, Railroads, Water Stations, Hotels, Mines, Garden Engines, &c.

Among the many testimonials given of this pump, is a gold medal awarded at the last great Fair of the American Institute.

No. 1 is a house or well pump and domestic Fire Engine, and will raise from 20 to 30 gallons per minute.

No. 2 will raise 100 gallons at 120 revolutions.
No. 2½ " 200 " 120 "
No. 3 " 300 " 120 "

The quantity raised can be doubled, by doubling the revolutions. These machines are manufactured and sold by the subscribers at Brockport, N. Y.. also in this city, 48 Courtland street, (corner of Greenwich,) by J. C. CARY.

Sept. 18–1y. CARY & BRAINERD.

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MANUFACTURED BY THE
BRIDGEWATER PAINT MANUFACTURING CO.,
NEW-JERSEY.

THE Company have now on hand a supply of this paint, which they offer to the public as the best article known for roofs and outside work on houses, or for brick and wood work generally. They can confidently recommend it as the most perfect protection from sparks and cinders, and therefore admirably adapted for decks of steamers, rail-road cars buildings and bridges, tow-boats, &c. It renders any thing upon which it is used perfectly water tight, and must therefore come into general use as a covering at all exposed to the rain. The strongest testimonials of the virtues of this article from officers of the army, superintendents of rail-roads, Insurance Companies, captains of vessels, painters, &c., may be seen, together with specimens on tin, wood, canvass, &c., at the depot of the Company. For sale, dry in packages of 200 lbs. and upwards, and in kegs of 25, 50, and 100 lbs., by

Feb, 1853.

R. ROGERT, General Agent.
126 PEARL AND 78 BEAVER STREET.

HIGHLAND NURSERIES, NEWBURGH,

A. SAUL & CO.,

In inviting the attention of their Patrons and the Public in general to their very extensive Collection of

Fruit and Ornamental Trees, Shrubs, &c.,

Would respectfully inform them that the stock which they offer for sale the coming spring is unusually fine, both as regards quality of trees, variety of kinds, &c., &c.

The soil and climate of our Hudson Highlands have rendered proverbial the success of the trees sent from here to all parts of the Union; and the accuracy and precision so indispensable in the propagation of fruit trees for which this establishment has long been celebrated, render errors in nomenclature of rare occurrence.

They have propagated in large quantities, all the *leading standard* varieties which are proved best adapted for general cultivation, especially those recommended by the American Pomological Society, as well as all *novelties*, both of *native* and *foreign* origin.

To particularize within the limits of an advertisement would be impossible; they refer to their General Catalogue, a copy of which will be sent to all *post-paid* applicants, on enclosing a Post-office stamp.

The following comprise a portion of their Stock, and are all of a fine growth: viz:

Pears in over 400 Varieties, both Standards on their own Stock for orchard culture, and on the Quince for Dwarfs, Pyramids, and Quenoucle for Garden Culture.

Apples in over 300 varieties, both Standards and Dw
Also, Cherries, both Standards and Dwarfs, Plum, Apri
Peach, Nectarine, and Quince trees in every variety.

Grape Vines, both Native and Foreign, for Vineries. A
Gooseberries, 50 best Lancashire Varieties; Currants, Rasp
ry and Strawberry plants, of all the leading and known k
together with Sea Kale, Asparagus, and Rhubarb roots.

Ornamental Trees, Shrubs and Vines, both deciduous an
evergreen, suitable for street and lawn planting, embracing
the new and rare Conifers, Weeping Trees and Shrubs of re
introduction.

Roses in every variety, including Hybrid Perpetual, Hy
Bourbon, Hybrid China, Hybrid Damask, Prairie Bours
Ayrshire, and other hardy climbing and Garden Varieties
well as the more tender—Tea, China, Bengal, Bourbon,
Noisette Varieties.

Herbaceous plants: A large collection of Peonies, Phlo
Campanula, Jonstemon. Œnothera, &c., &c.

Dahlias and bedding plants for the parterre and flower
den, in large quantities and varieties.

Hedge Plants: 100,000 Buckthorn and Osage Orange pl
two years' growth; Arbor Vitæ for Screens, &c., &c.

Dealers and Planters of trees on a large scale will be
with on the most liberal terms.

A. SAUL & Co.

Newburgh, Feb. 20, 1853.

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AGRICULTURAL AND HORTICULTURAL

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nished gratis upon personal or pre-paid application.

June, 3m. 2268.

D. LANDRETH, Philadelphia

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THE subscribers manufacture and keep constantly on hand, Church, Factory, Steamboat, Locomotive, Plantation, and School-house Bells, varying in weight from 10 lbs. to 4,000 lbs., with the most approved hangings.

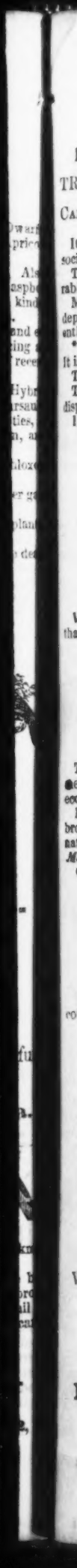
At this Establishment small Bells pass through the same process in manufacturing as large ones, and we flatter ourselves that the Bells turned out at this Foundry are superior in point of tone and workship to those of any other in the Union.

We have 13 Gold and Silver Medals which have awarded for the *best* Bells. The patterns have been imp upon for the past thirty years. Communications by ma receive prompt attention. Orders for Bells of any size filled as soon as received.

Address, at West Troy, N. Y., **A. MENEELY'S SONS.**

Hitchcock & Co., Agents, 116 Broadway, New-York.

MATHEMATICAL INSTRUMENTS FURNISHED, OF THE BEST DESCRIPTION. Dec. '52



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Published lately by A. HART, (late Carey & Hart,) No. 126 Chesnut street, corner of Fourth. THE SLAVE TRADE, DOMESTIC and FOREIGN; WHY IT EXISTS, AND HOW IT MAY BE EXTINGUISHED. By H. C. CAREY. Complete in one volume.

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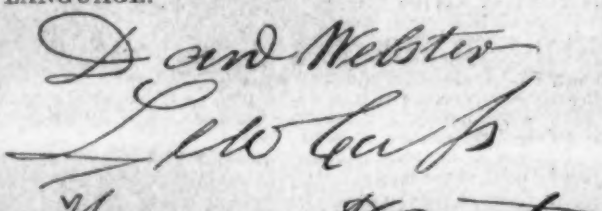

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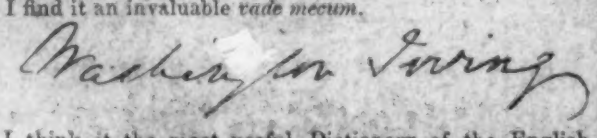

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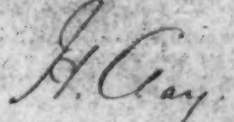

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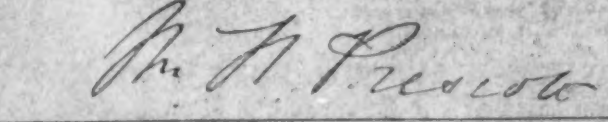

WASHINGTON, *Jan.* 31, 1850.

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